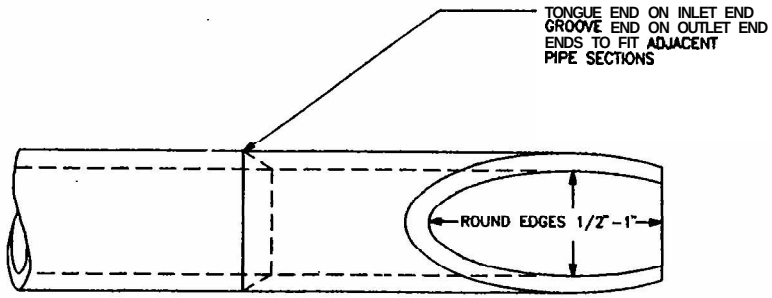
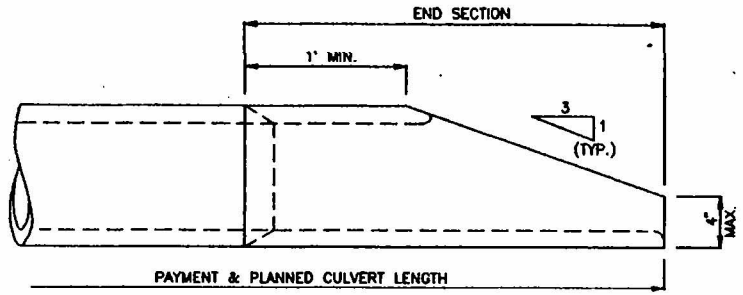
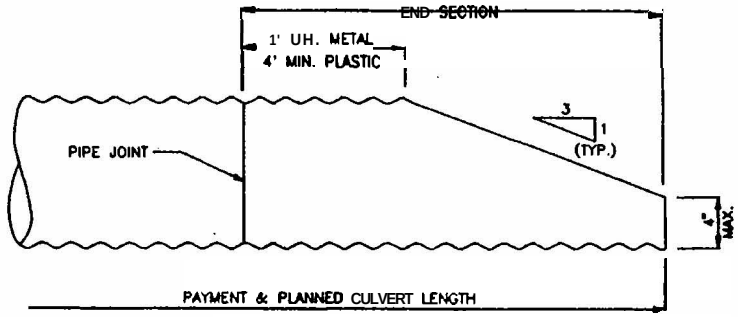


PLAN



ELEVATION

CONCRETE PIPE



METAL & PLASTIC PIPE

NOTE:

SIDE SLOPE SHALL BE WARPED TO MATCH THE BEVELED PIPE END. WHEN CULVERT IS ON SKEW. BMLED END SHALL BE ROTATED TO CONFORM TO SLOPE. IF SLOPE DIFFERS FROM 3:1, PIPE SHALL BE BMLED TO MATCH SLOPE.

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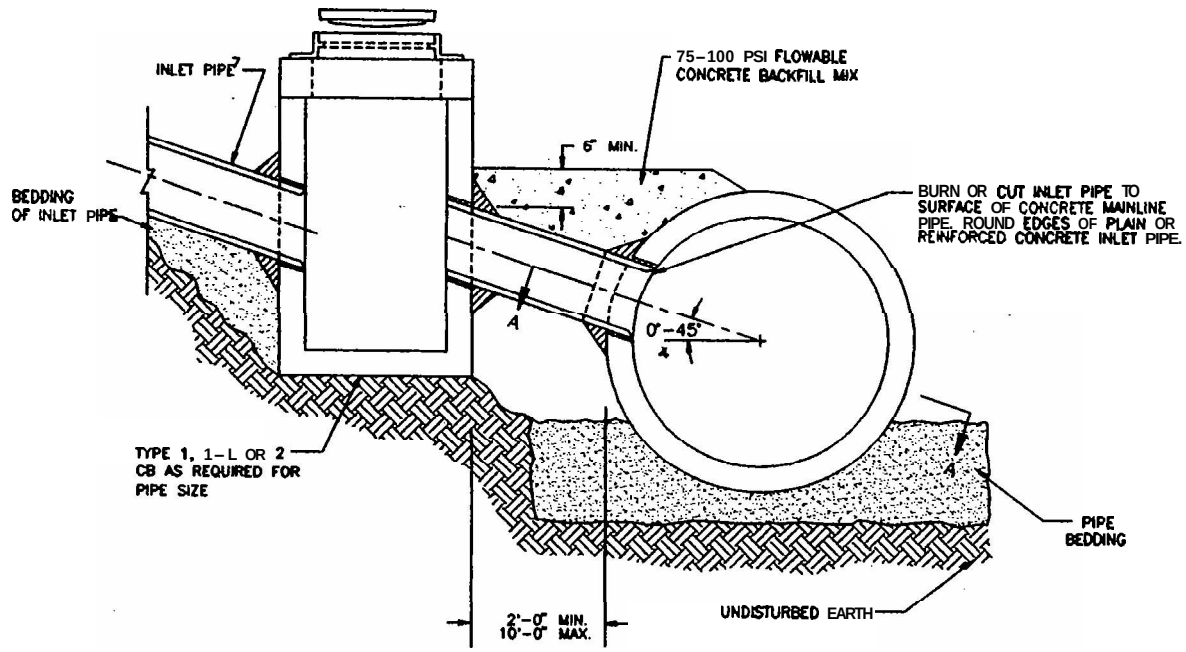
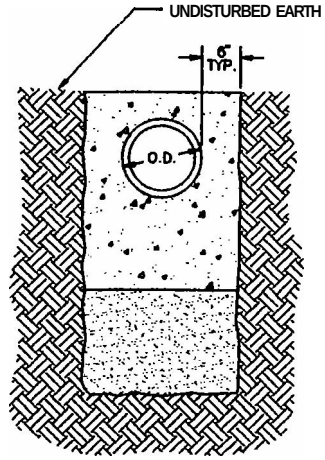
BEVELED END PIPE SECTION

DWG. NO. 2-001

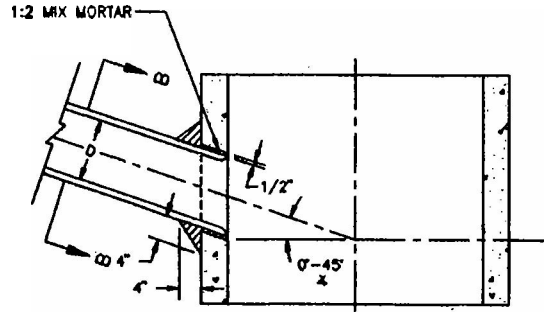




SECTION B-B

NOTES:

1. "D". THE INSIDE DIAM. OF THE INLET PIPE. SHALL BE 24" OR LESS. FOR LARGER VALUES OF "D", USE AN APPROVED STRUCTURE.
2. IN NO CASE SHALL THE OUTSIDE DIAM. OF THE INLET PIPE EXCEED ONE-HALF THE INSIDE DIAM. OF THE MAIN STORM SEWER.
3. ℄ OF INLET PIPE SHALL BE ON RADIUS OF MAIN STORY DRAIN.
4. THE MIN. OPENING INTO THE EXISTING STORM DRAIN SHALL BE THE OUTSIDE DIAM. OF THE INLET PIPE PLUS 1 IN.
5. IF 4 IS GREATER THAN 45' FIELD TAPPING IS NOT ALLOWED.
6. SEE SEC. 7.04.
7. SEE SEC. 7.03 FOR ALLOWED INLET PIPE TYPE.
8. MAINLINE SHALL HAM 4 6 MIN. DIAM.



SECTION A-A

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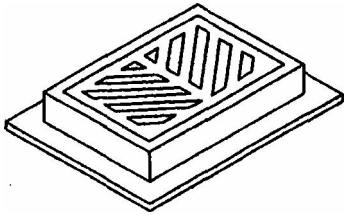
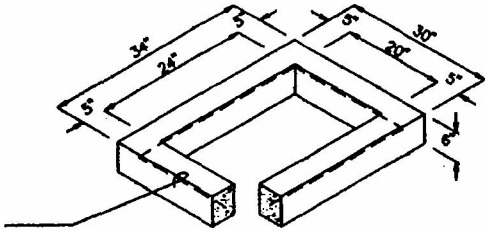
KING COUNTY, WASHINGTON

FIELD-TAPPING OF CONCRETE PIPE

DWG. NO. 2-002

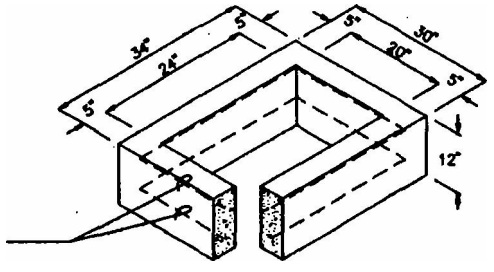


FRAME AND GRATE
SEE SEC. 7.05 AND
APPLICABLE DWGS.



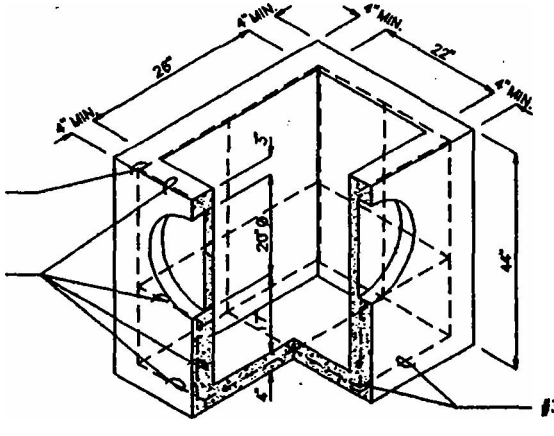
1 #3 BAR HOOP

6" RISER SECTION



2 #3 BAR HOOPS

12" RISER SECTION



#3 BAR EACH CORNER

#3 BAR EACH SIDE

PRECAST BASE SECTION
(MEASUREMENT AT THE TOP
OF THE BASE)

#3 BAR EACH WAY

NOTES

1. CATCH BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 (MSHTO M 199) & C890 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE WSDOT/APWA STANDARD SPECIFICATIONS
2. AS AN ACCEPTABLE ALTERNATIVE TO REBAR, WELDED WIRE FABRIC HAVING A MIN. AREA OF 012 SQUARE INCHES PER FOOT MAY BE USED. WELDED WIRE FABRIC SHALL COMPLY TO ASTM A497 (MSHTO M 221) WIRE FABRIC SHALL NOT BE PLACED IN KNOCKOUTS.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000.
4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MIN. ALL PIPE SHALL BE INSTALLED IN FACTORY PROVIDED KNOCKOUTS UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT.
5. KNOCKOUT OR CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIAM. PLUS CATCH BASIN WALL THICKNESS.
6. ROUND KNOCKOUTS MAY BE ON ALL 4 SIDES. WITH MAX. DIAM. OF 26. KNOCKOUTS MAY BE EITHER ROUND OR "D" SHAPE.
7. THE MAX. DEPTH FROM THE FINISHED GRADE TO THE PIPE INVERT IS 5'-0".
8. THE TAPER ON M E SIDES OF THE PRECAST BASE SECTION AND RISER SECTION SHALL NOT EXCEED 1/2"/FT.
9. CATCH BASIN FRAME AND GRATE SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-621D. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
10. FRAME AND GRATE MAY BE INSTALLED WITH FLANGE DOWN OR CAST INTO RISER.
11. FOR CATCH BASINS IN PARKING LOTS REFER TO WSDOT/APWA STANDARD DWG. B1-b.
12. EDGE OF RISER OR BRICK SHALL NOT BE MORE THAN 2" FROM VERTICAL EDGE OF CATCH BASIN WALL

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KING COUNTY PUBLIC WORKS
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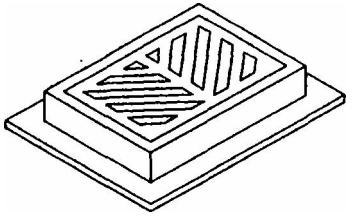
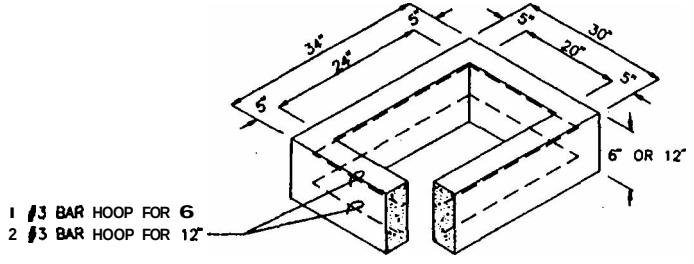
CATCH BASIN TYPE 1

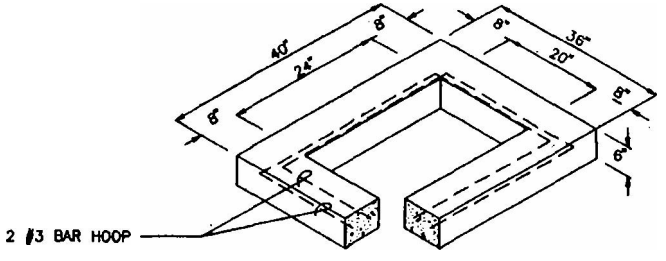
DWG. NO. 2-003



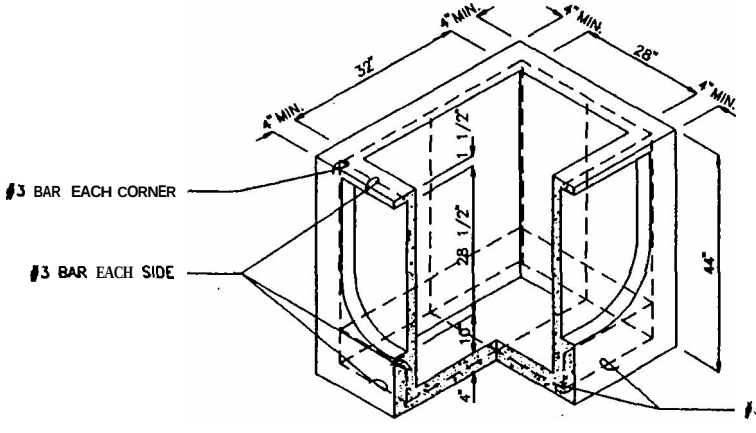
FRAME AND GRATE
SEE SEC. 7.05 AND APPLICABLE DWGS.



RISER SECTION



6" REDUCING SECTION



PRECAST BASE SECTION
(MEASUREMENT AT THE TOP OF THE BASE)

NOTES:

1. CATCH BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 (AASHTO M 199) & C890 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE WSDOT/APWA STANDARD SPECIFICATIONS.
2. AS AN ACCEPTABLE ALTERNATIVE TO REBAR, WELDED WIRE FABRIC HAVING A MIN AREA OF 0 12 SQUARE INCHES PER FOOT MAY BE USED WELDED WIRE FABRIC SHALL COMPLY TO ASTM A497 (AASHTO M 221). WIRE FABRIC SHALL NOT BE PLACED IN KNOCKOUTS.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000.
4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MIN. ALL PIPE SHALL BE INSTALLED IN FACTORY PROVIDED KNOCKOUTS UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT
5. KNOCKOUT OR CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIAM. PLUS CATCH BASIN WALL THICKNESS
6. KNOCKOUTS MAY BE ON ALL 4 SIDES WITH MAX DIAM OF 28". KNOCKOUTS MAY BE EITHER ROUND OR "D" SHAPE
7. THE TAPER ON THE SIDES OF M E PRECAST BASE SECTION AND RISER SECTION SHALL NOT EXCEED 1/2 "/FT.
8. CATCH BASIN FRAME AND GRATE SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-621D MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION
9. FRAME AND GRATE MAY BE INSTALLED WITH FLANGE DOWN OR CAST INTO RISER
10. MAX. DEPTH FROM FINISHED GRADE TO PIPE INVERT SHALL BE 5'-0"
11. EDGE OF REDUCING SECTION OR BRICK SHALL NOT BE MORE THAN 2" FROM VERTICAL EDGE OF CATCH BASIN WALL

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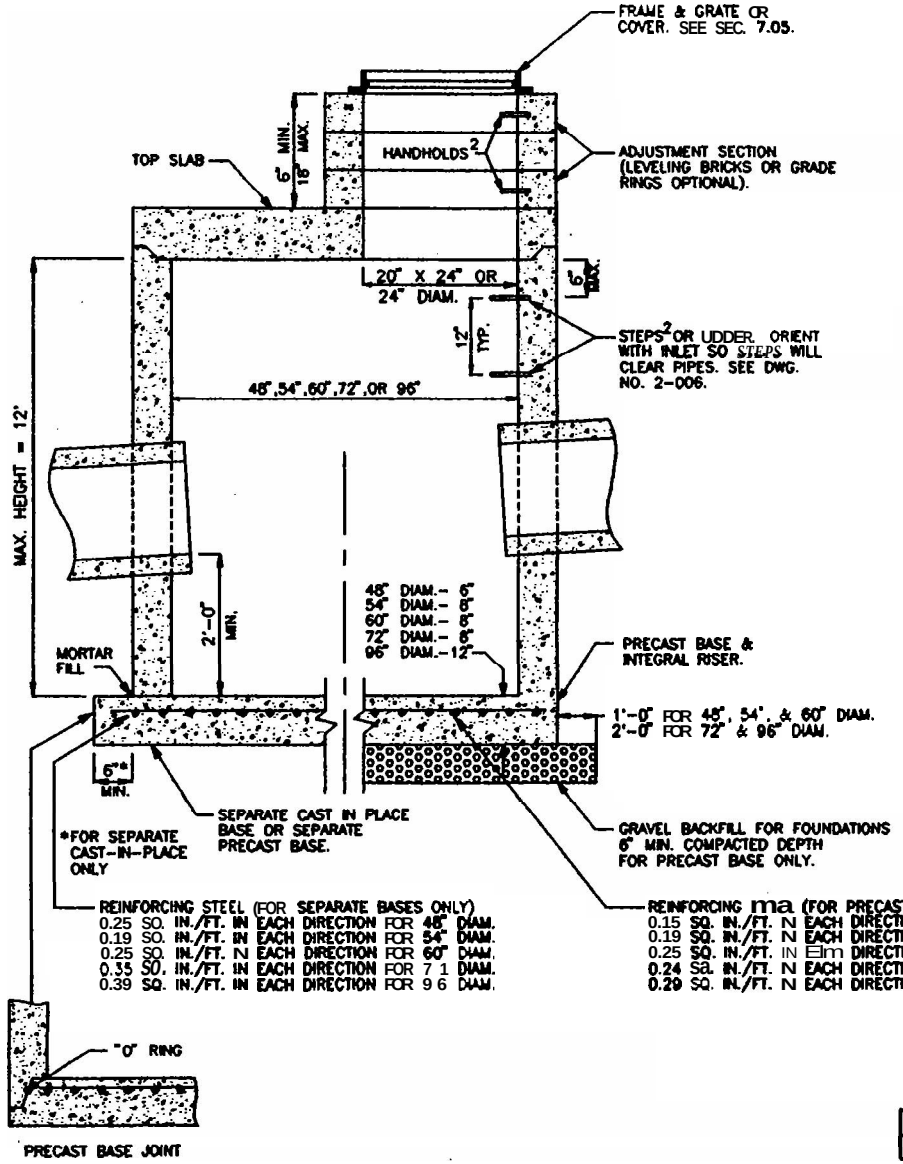
CATCH BASIN TYPE 1-L

DWG. NO. 2-004



NOTES:

1. CATCH **BASINS** SHALL BE **CONSTRUCTED** IN ACCORDANCE WITH **ASTM** C478 **(AASHTO M199)** AND ASTM **C890** UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE **WSDOT/APWA** STANDARD SPECIFICATIONS.
2. **HANDHOLDS** IN ADJUSTMENT SECTION SHALL HAVE **3" MIN.** CLEARANCE. STEPS IN CATCH **BASIN** SHALL **HAVE 6" MIN.** CLEARANCE. SEE DWG. NO. **2-006,** CATCH **BASIN** DETAILS. HANDHOLDS SHALL BE PLACED IN ALTERNATING GRADE **RINGS** OR **LEVELING** BRICK COURSE WITH A MIN. OF ONE **HANDHOLD BETWEEN** THE **LAST** STEP AND TOP OF THE MANHOLE.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000. **ALL** PRECAST CONCRETE SHALL BE CLASS 4000.
4. PRECAST **BASES** SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE WALL THICKNESS OF 2" MIN. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT. PIPES SHALL BE INSTALLED ONLY IN FACTORY KNOCKOUTS UNLESS **OTHERWISE APPROVED** BY THE ENGINEER.
5. KNOCKOUT OR CUTOUT HOLE **SIZE** SHALL EQUAL **PIPE** OUTER **DIAM.** PLUS **CATCH BASIN** WALL THICKNESS. MAX. HOLE **SIZE** SHALL BE **36"** FOR **48'** CATCH BASIN. **42"** FOR **54"** C.B.. **48'** FOR **60" C.B.,** 6 6 FOR 7 1 C.B.. 84" FOR **96"** C.B. MIN. DISTANCE BETWEEN HOLES SHALL BE **8" FOR 48",** 54", AND **60"** C.B.; **12"** FOR **72"** AND **96"** C.B.
6. CATCH **BASIN** FRAMES AND GRATES OR COVERS SHALL BE ,IN ACCORDANCE WITH SEC. 7.05 AND MEET THE STRENGTH REQUIREMENTS Of FEDERAL SPECIFICATION RR-F-621D. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
7. ALL BASE REINFORCING STEEL SHALL HAVE A MIN. **YIELD** STRENGTH OF **60,000** PSI AND BE PLACED IN THE UPPER HALF OF THE BASE **WITH** 1' MIN. CLEARANCE.
8. MIN. **SOIL BEARING** VALUE SHALL EQUAL 3,300 POUNDS PER SQUARE FOOT.
9. FOR DETAILS SHOWING LADDER. STEPS. **HANDRAILS** AND TOP SLABS. SEE DWG. NO. **2-006.**
10. SEE THE **WSDOT/APWA** STANDARD SPECIFICATIONS SEC. **7-05.3** FOR **JOINT** REQUIREMENTS.

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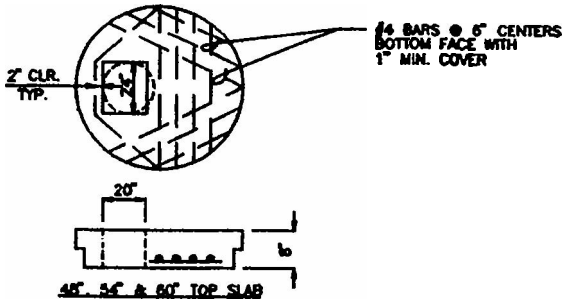
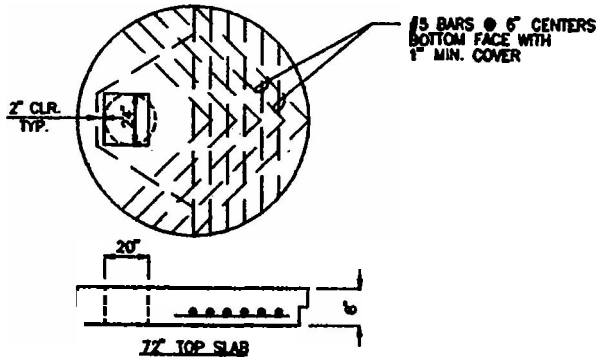
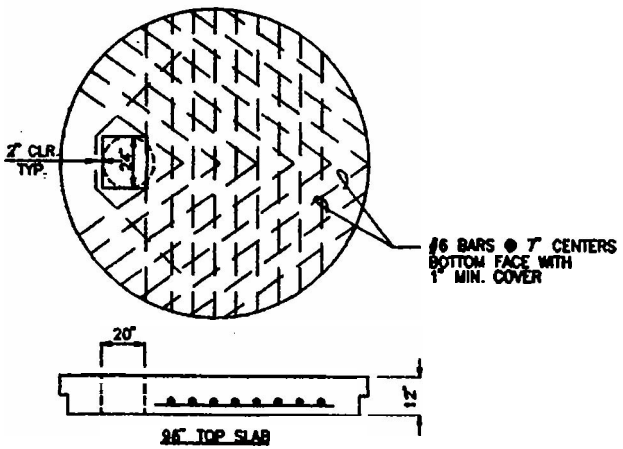
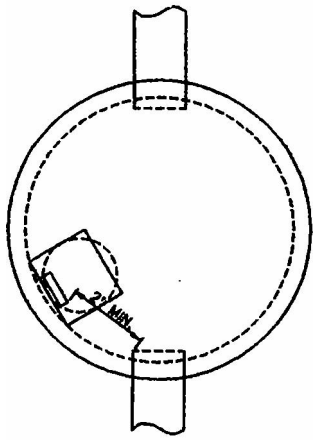
KING COUNTY PUBLIC WORKS KING COUNTY. WASHINGTON	CATCH BASIN TYPE 2 **48", 54", 60", 72", & 96"**	DWG. NO. **2-005**

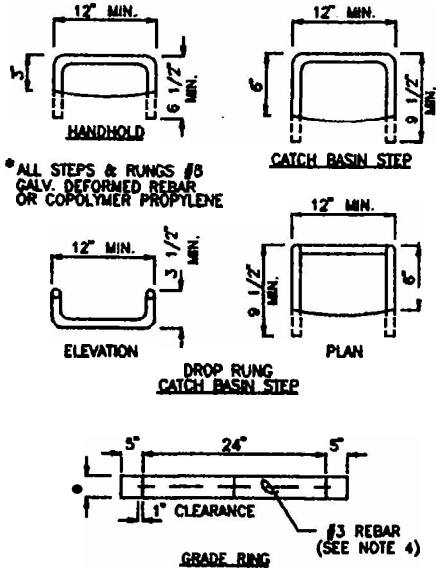






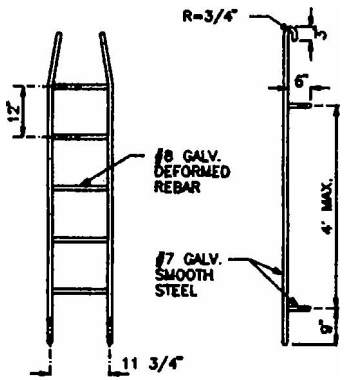


TYPICAL ORIENTATION
FOR ACCESS AND STEPS



NOTES:

1. PROPRIETARY CATCH **BASIN** HANDHOLDS AND STEPS ARE **ACCEPTABLE. PROVIDED** THAT THEY CONFORM TO SEC. R **ASTM** C478, **AASHTO M-199** AND MEET ALL **WISHA** REQUIREMENTS.
2. CATCH BASIN **STEP/HANDHOLD** LEGS SHALL BE **PARALLEL** OR **APPROXIMATELY** RADIAL AT THE OPTION OF THE WNUFACTURER. EXCEPT THAT ALL STEPS IN ANY CATCH **BASIN SHALL** BE SIMILAR. PENETRATION OF OUTER WALL BY A **LEG** IS PROHIBITED.
3. **HANDHOLDS** AND STEPS SHALL HAVE **"DROP"** RUNGS AS SHOWN ON **DETAIL** OR PROTUBERANCES TO **PREVENT** SIDEWAYS SUP.
4. SLAB OPENING MAY BE 24" X 20" OR 24" DIAM.
5. AS AN ACCEPTABLE **ALTERNATIVE** TO **REBAR,** WELDED **WIRE FABRIC HAVING** A MIN. AREA OF 0.12 SQUARE INCHES PER FOOT MAY BE USED. WELDED **WIRE** FABRIC **SHALL** COMPLY TO ASTM **A497.**
6. **LADDERS** OR **STEPS** SHALL EXTEND TO **WITHIN** 1 6 OF BOTTOM OF CATCH BASIN.
7. HANGING UDDERS SHALL BE PERMANENTLY FASTENED AT TOP BY **HANGING** ON STEP OR BY BOLTING OR EMBEDDING IN CONCRETE. **EACH** SHALL BE EMBEDDED AT **BOTTOM** IN BASE.
8. **ADDITIONAL** SAFETY FEATURES MAY BE REQUIRED IN MRY DEEP OR UNUSUAL STRUCTURES.



PREFABRICATED LADDER

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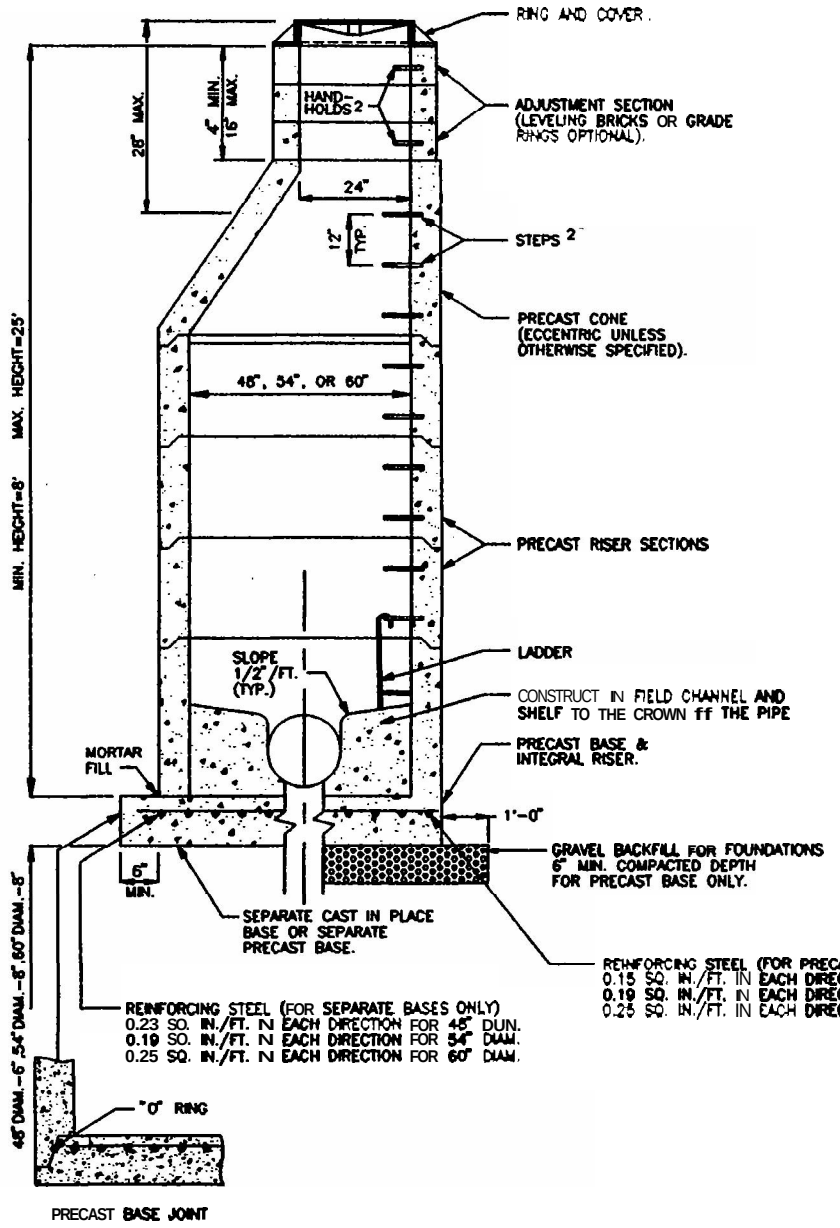
KING COUNTY, WASHINGTON

CATCH BASIN DETAILS

DWG. NO. 2-006



NOTES:

1. MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH **AASHTO M199** UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE **WSDOT/APWA** STANDARD SPECIFICATIONS.
2. HANDHOLDS IN ADJUSTMENT SECTION SHALL **HAVE 3" MIN.** CLEARANCE. STEPS IN MANHOLE SHALL HAVE **6"** MIN. CLEARANCE. SEE DWG. NO. **2-011,** 'MANHOLE DETAILS.' **HANDHOLDS** SHALL BE PLACED IN ALTERNATING **GRADE** RINGS OR **LEVELING** BRICK COURSE WITH A MIN. OF ONE HAND HOLD BETWEEN THE LAST STEP AND THE TOP OF THE WHOLE.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS **4000.** ALL PRECAST CONCRETE SHALL BE CLASS 4000. WON-REINFORCED CONCRETE IN CHANNEL AND SHELF SHALL BE **CLASS** 3000.
4. PRECAST **BASES** SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE WALL THICKNESS OF 2" MIN. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS **LEFT** INTACT. PIPES SHALL BE INSTALLED ONLY IN FACTORY KNOCKOUTS UNLESS OTHERWISE APPROVED BY THE ENGINEER.
5. KNOCKOUT OR **CUTOUT** HOLE **SIZE** SHALL EOUAL **PIPE** OUTER **DIAM.** PLUS MANHOLE WALL THICKNESS. **MAX.** HOLE **SIZE** SHALL BE **36"** FOR 48" MANHOLE. **42"** FOR **54"** MANHOLE, 4 8 FOR 6U' M.H. MIN. DISTANCE **BETWEEN** HOLES SHALL BE 8".
6. MANHOLE RINGS AND COVERS SHALL BE IN ACCORDANCE **WITH** SEC. 7.05 AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-621D. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT **WITH** ANY COVER POSITION.
7. ALL BASE REINFORCING STEEL SHALL HAVE A MIN. VELD STRENGTH OF **60,000** PSI AND BE PLACED IN THE UPPER HALF OF THE BASE WITH **1" MIN.** CLEARANCE.
8. FOR **HEIGHTS** OF 12' OR LESS. MIN. **SOIL** BEARING VALUE SHALL EQUAL **3,300** POUNDS PER **SQUARE** FOOT. FOR HEIGHTS OVER 12'. **MIN. SOIL** BEARING VALUE SHALL EQUAL 3.800 POUNDS PER SQUARE FOOT.
9. FOR' DETAILS SHOWING **GRADE** RING. **LADDER,** STEPS. HANDHOLDS, AND TOP SLABS. SEE DWG. NO. **2-011, "MANHOLE** DETAILS..
10. SEE THE **WSDOT/APWA** STANDARD SPECIFICATIONS SEC. 7-05.3 FOR JOINT REQUIREMENTS.

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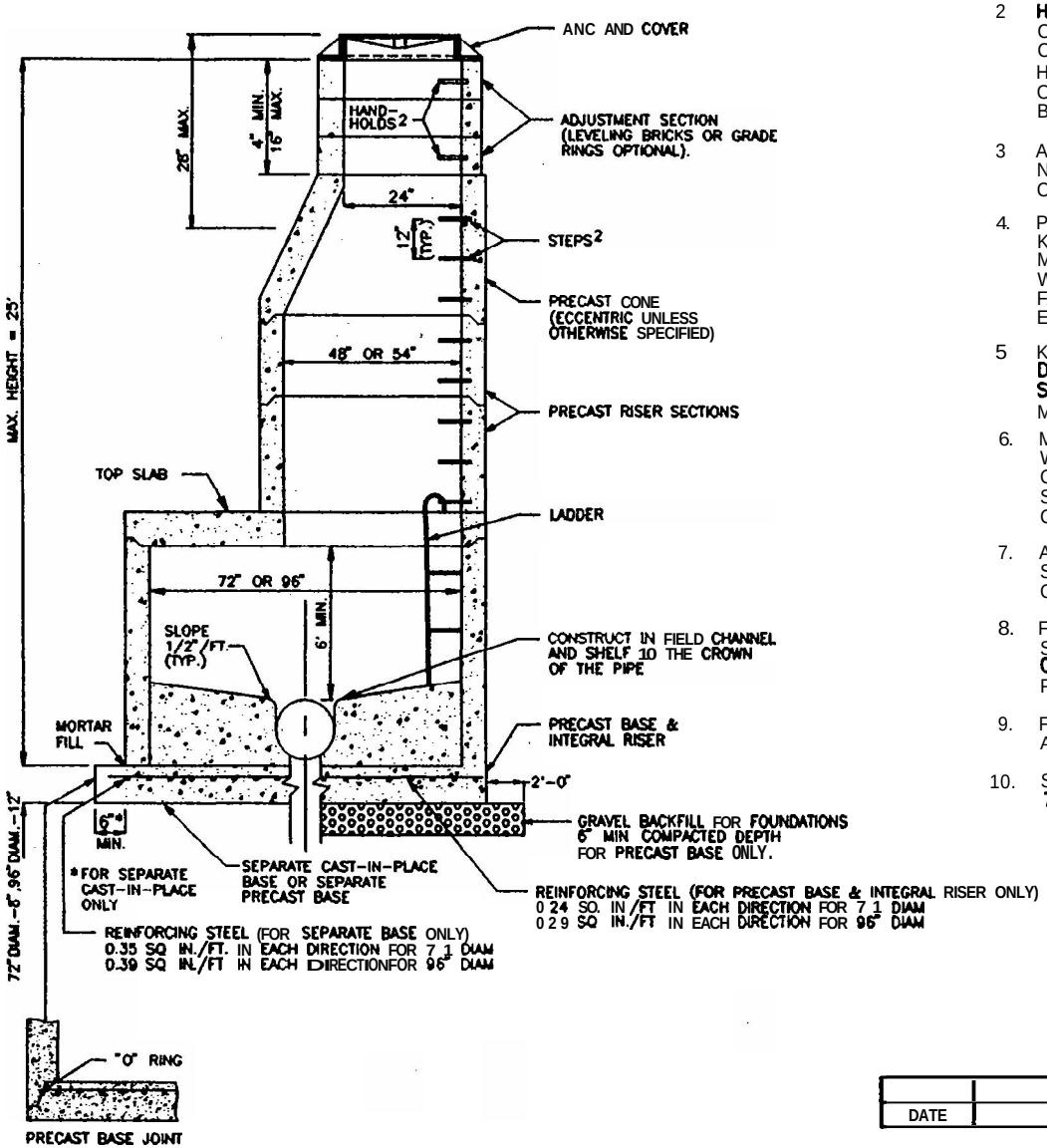
.MANHOLE TYPE 1 48", 54", & 60"

DWG. NO. *2-007*



NOTES

1. MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH AASHTO **M199** UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE **WSDOT/APWA** STANDARD SPECIFICATIONS.
2. **HANDHOLDS** IN ADJUSTMENT SECTION SHALL HAVE 3" MIN CLEARANCE STEPS IN MANHOLE **SHALL** HAVE 6" MIN CLEARANCE. SEE DWG. NO 2-011, "MANHOLE DETAILS.' HANDHOLDS SHALL BE PLACED IN ALTERNATING GRADE RINGS OR **LEVELING BRICK** COURSE WITH MIN. OF ONE **HANDHOLD** BETWEEN THE **LAST** STEP AND THE TOP OF THE MANHOLE.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000 NON-REINFORCED CONCRETE IN CHANNEL AND SHELF SHALL BE CLASS 3000. ALL PRECAST CONCRETE SHALL BE CLASS 4000.
4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS KNOCKOUTS SHALL HAVE WALL THICKNESS OF **2"** MIN. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT PIPES SHALL BE INSTALLED ONLY IN FACTORY KNOCKOUTS UNLESS OTHERWISE APPROVED BY THE ENGINEER.
5. KNOCKOUT OR CUTOUT HOLE **SIZE** SHALL EQUAL **PIPE** OUTER **DIAM** PLUS MANHOLE WALL THICKNESS MAX HOLE **SIZE** SHALL BE 60" FOR 72' MANHOLE, 84" FOR 96" MANHOLE. MIN. DISTANCE **BETWEEN** HOLES SHALL BE **12"**
6. MANHOLE RINGS AND COVERS SHALL BE IN ACCORDANCE WITH SEC 7.05 AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-621D MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
7. ALL **BASE** REINFORCING STEEL SHALL HAVE A MIN. YIELD STRENGTH OF 60,000 PSI AND BE **PLACED** IN THE UPPER HALF OF THE BASE **WITH** 1' MIN. CLEARANCE
8. FOR HEIGHTS OF 12' OR LESS. **MIN. SOIL** BEARING VALUE SHALL EQUAL 3.300 POUNDS PER SQUARE FOOT. FOR HEIGHTS **OVER** 12'. **MIN SOIL** BEARING VALUE SHALL EQUAL 3.800 POUNDS PER SQUARE FOOT.
9. FOR DETAILS SHOWING GRADE RING. LADDER. STEPS, **HANDHOLDS,** AND TOP SLABS. SEE DWG. NO. **2-011,** 'MANHOLE DETAILS.
10. SEE THE **WSDOT/APWA** STANDARD SPECIFICATIONS SEC. **7-05.3** FOR JOINT REQUIREMENTS

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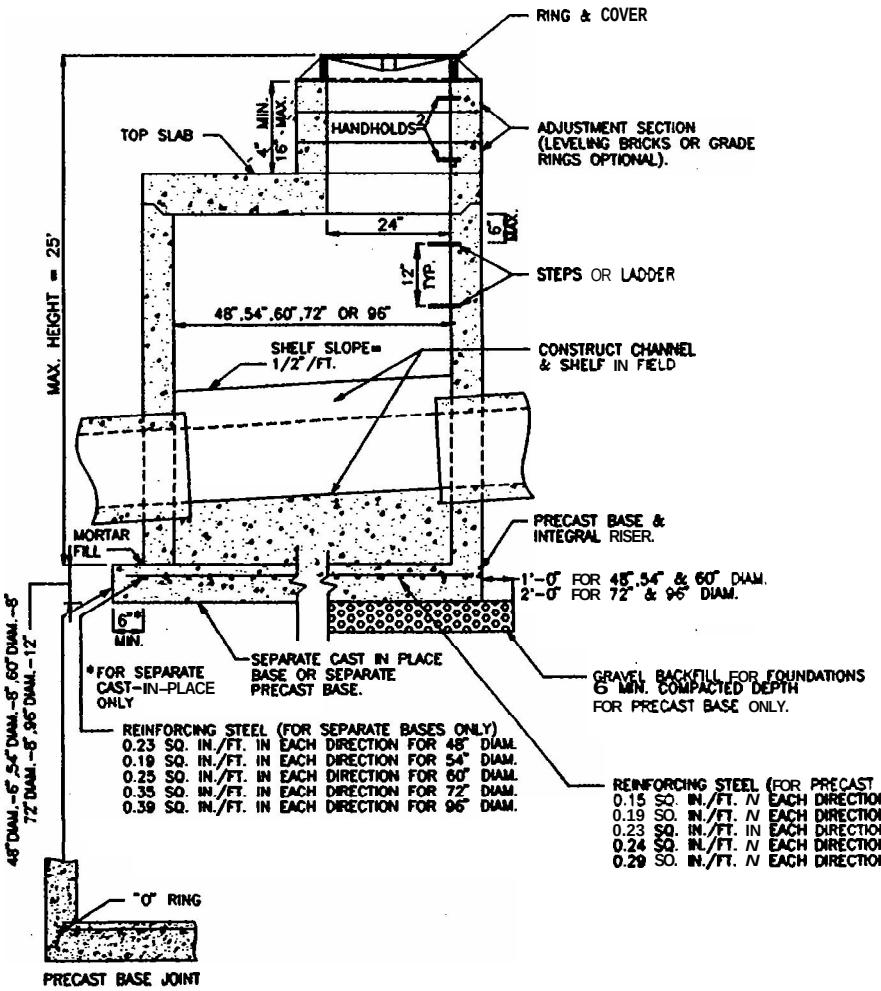
MANHOLE TYPE 2 72" & 96"

NO. **2-008**



NOTES:

1. WHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH **AASHTO M199** UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE **WSDOT/APWA** STANDARD SPECIFICATIONS.
2. HANDHOLDS IN ADJUSTMENT SECTION SHALL HAM **3"** MIN. CLEARANCE. STEPS IN MANHOLE **SHALL** HAM **6"** MIN. CLEARANCE. SEE DWG. NO. 2-011. "MANHOLE DETAILS." **HANDHOLDS** SHALL .BE PLACED IN ALTERNATING GRADE RINGS OR **LEVELING** BRICK COURSE **WITH** A MIN. OF ONE **HANDHOLD** BETWEEN THE **LAST** STEP AND THE TOP OF THE WHOLE.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS **4000.** NON-REINFORCED CONCRETE IN CHANNEL AND SHELF SHALL BE CLASS 3000. ALL PRECAST CONCRETE SHALL BE CLASS **4000.**
4. **PRECAST** BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL **HAVE** WALL THICKNESS OF **2"** MIN. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT. PIPES SHALL BE INSTALLED ONLY IN FACTORY KNOCKOUTS UNLESS OTHERWISE **APPROVED** BY THE ENGINEER.
5. KNOCKOUT OR CUTOUT HOLE **SIZE** SHALL EOUAL **PIPE** OUTER **DIAM.** PLUS MANHOLE WALL THICKNESS. MAX. HOLE **SIZE** SHALL BE **36"** FOR 48 M.H. **42"** FOR **54" M.H.,** 48 FOR 60" M.H. 60" FOR **72" M.H.,** 84 FOR 96 M.H. MIN. DISTANCE BETWEEN HOLES SHALL BE **8"** FOR 48. **54",** AND 60' **M.H., 12"** FOR 7 1 AND **96"** M.H.
6. **MANHOLE** RINGS AND COVERS SHALL BE IN ACCORDANCE **WITH** SEC. **7.05** AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION **RR-F-621D. MATING** SURFACES SHALL BE **FINISHED** TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
7. ALL BASE REINFORCING STEEL **SHALL** HAVI A MIN. **YIELD** STRENGTH OF 60.000 PSI AND BE PLACED IN THE UPPER HALF OF THE **BASE WITH** 1 MIN. CLEARANCE.
8. FOR 'HEIGHTS OF 12' OR LESS. **MIN. SOIL** BEARING VALUE SHALL EOUAL 3.300 POUNDS PER SQUARE FOOT. FOR **HEIGHTS** OVER 12'. MIN. SOIL BEARING VALUE SHALL EQUAL **3,800** POUNDS PER SQUARE FOOT.
9. FOR **DETAILS** SHOWING **GRADE** RING. LADDER. STEPS. **HANDHOLDS,** AND TOP SLABS. SEE DWG. NO. 2-011. **"MANHOLE** DETAILS."
10. SEE THE **WSDOT/APWA** STANDARD **SPECIFICATIONS** SEC. **7-05.3** FOR JOINT REQUIREMENTS.

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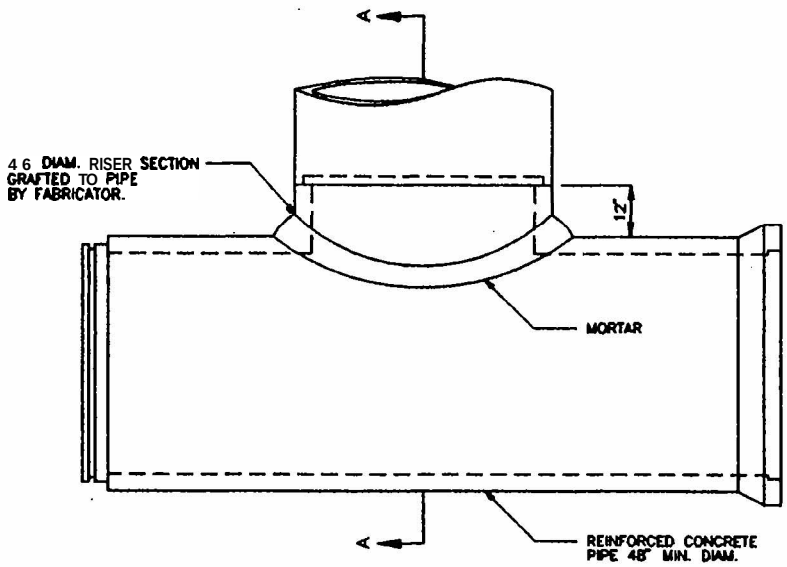
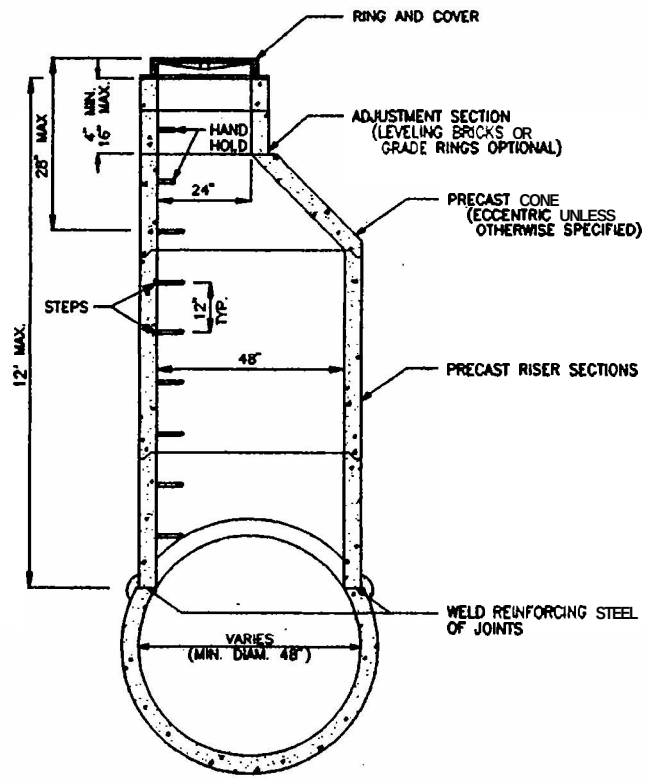
KING COUNTY PUBLIC WORKS KING COUNTY, WASHINGTON	MANHOLE TYPE 3 48", 54", 60", 72", & 96"	DWG. NO. 2-009

NOTES:

1. MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M199 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE WSDOT/APWA STANDARD SPECIFICATIONS.
2. HANDHOLDS IN ADJUSTMENT SECTION SHALL HAVE 3" MIN. CLEARANCE. STEPS IN MANHOLE SHALL HAVE 6" MIN. CLEARANCE. SEE DWG. NO. 2-011, "MANHOLE DETAILS."
3. MANHOLE RINGS AND COVERS SHALL BE IN ACCORDANCE WITH SEC. 7.05 AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-621D. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
4. ALL PRECAST CONCRETE SHALL BE CLASS 4000.
5. FOR DETAILS SHOWING GRADE RING, LADDER, STEPS, HANDHOLDS, AND TOP SLABS, SEE DWG. NO. 2-011, "MANHOLE DETAILS".
6. NOT FOR USE IN TRAFFIC BEARING AREAS.



ELEVATION



SECTION A-A

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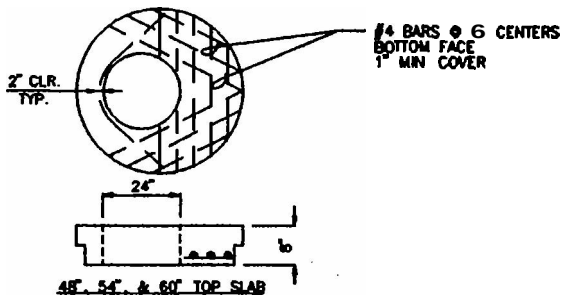
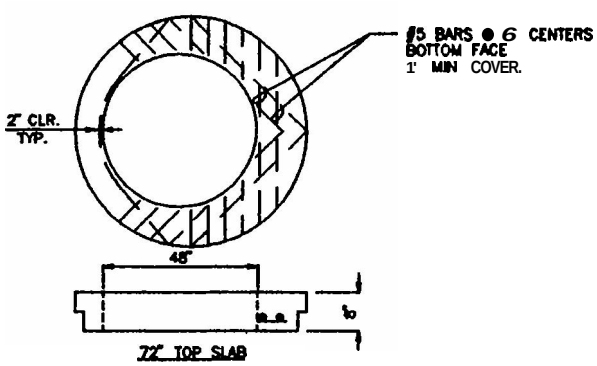
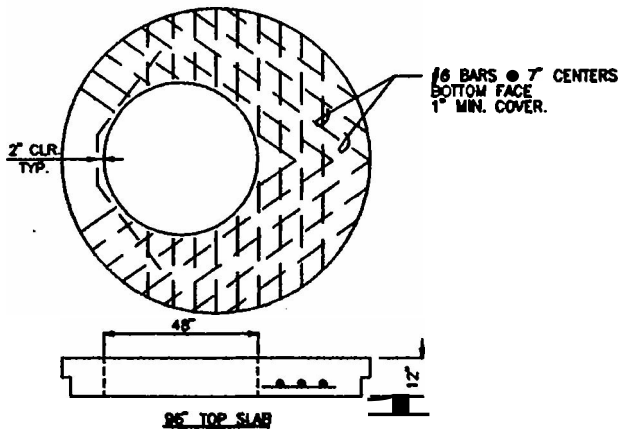
KING COUNTY PUBLIC WORKS
KING COUNTY, WASHINGTON

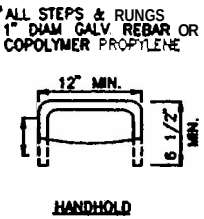
MANHOLE TYPE 4

DWG. NO. 2-010

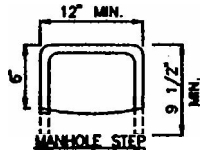




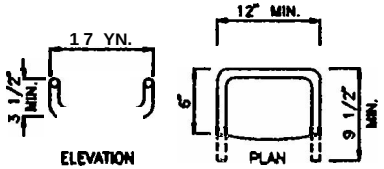




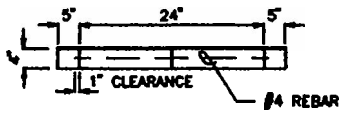
HANDHOLD



MANHOLE STEP



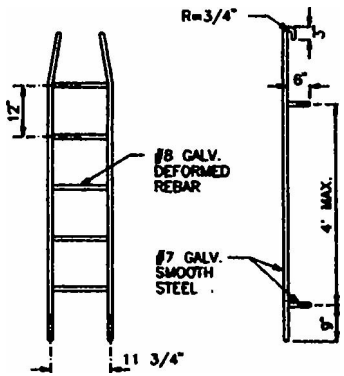
MANHOLE DROP RUNG STEP



GRADE RING

NOTES.

1. PROPRIETARY MANHOLE HANDHOLDS AND STEPS ARE ACCEPTABLE. **PROVIDED** THAT THEY CONFORM TO SEC. R. ASTM C478, **AASHTO** M199 AND **MEET** ALL **WISHA REQUIREMENTS.**
2. WHOLE **STEP/HANDHOLD** LEGS SHALL BE PARALLEL OR **APPROXIMATELY** RADIAL AT THE OPTION OF THE MANUFACTURER. EXCEPT THAT ALL STEPS IN ANY WHOLE SHALL BE SIMILAR. PENETRATION OF OUTER WALL BY A LEG IS PROHIBITED.
3. **HANDHOLDS** AND STOPS SHALL HAVE **"DROP" RUNGS** OR PROTUBERANCES TO PREVENT SIDEWAYS SLIP.
4. LADDERS OR STEPS SHALL EXTEND TO **WITHIN** 16 OF **BOTTOM** OF MANHOLE.
5. HANGING LADDERS SHALL BE PERMANENTLY FASTENED AT TOP BY **HANGING** ON STEP OR BY BOLTING OR EMBEDDING IN **CONCRETE.** EACH SHALL BE EMBEDDED AT BOTTOM IN EASE.
6. ADDITIONAL **SAFETY** FEATURES **MAY** BE REQUIRED



PREFABRICATED LADDER

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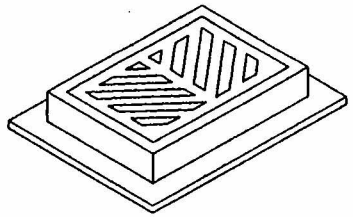
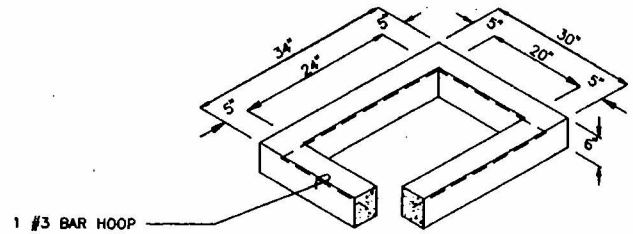
KING COUNTY PUBLIC WORKS
KING COUNTY, WASHINGTON

MANHOLE DETAILS

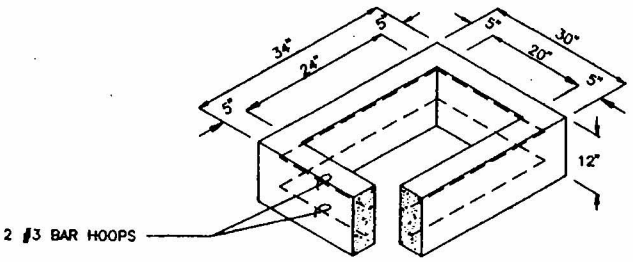
DWG. NO. 2-011



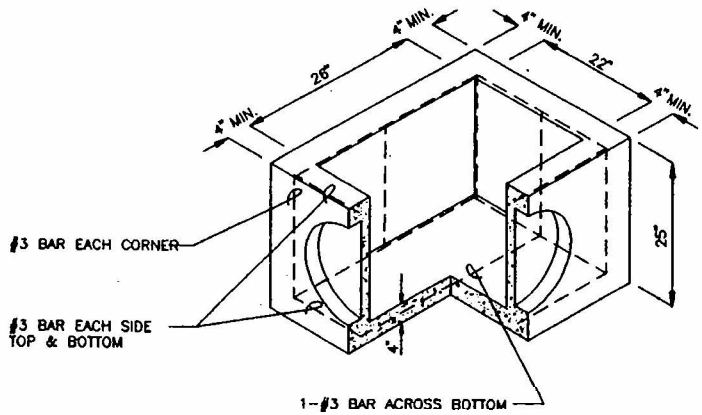
FRAME AND GRATE
SEE SEC. 7.05 AND
APPLICABLE DWGS.



6" RISER SECTION



12" RISER SECTION



PRECAST BASE SECTION
(MEASUREMENT AT THE TOP
OF THE BASE)

NOTES:

1. CURB INLET TO BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 & C890 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE STANDARD SPECIFICATIONS.
2. AS AN ACCEPTABLE ALTERNATIVE TO REBAR, WELDED WIRE FABRIC HAVING A MIN. AREA OF 0.12 SQUARE INCHES PER FOOT MAY BE USED. WELDED WIRE FABRIC SHALL COMPLY TO ASTM A497. WIRE FABRIC SHALL NOT BE PLACED IN KNOCKOUTS.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000.
4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MIN. ALL PIPE SHALL BE INSTALLED IN FACTORY PROVIDED KNOCKOUTS. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT.
5. KNOCKOUT OR CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIAM. PLUS CURB INLET WALL THICKNESS.
6. ROUND KNOCKOUTS MAY BE ON ALL 4 SIDES WITH MAX. DIAM. OF 17".
7. THE MAX. DEPTH FROM THE FINISHED GRADE TO THE PIPE INVERT IS 5'-0".
8. THE TAPER ON THE SIDES OF THE PRECAST BASE SECTION AND RISER SECTION SHALL NOT EXCEED 1/2"/FT.
9. CONCRETE INLET FRAME AND GRATES SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-621D. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY OTHER COVER POSITION.
10. FRAME AND GRATE MAY BE INSTALLED WITH FLANGE DOWN OR CAST INTO RISER.

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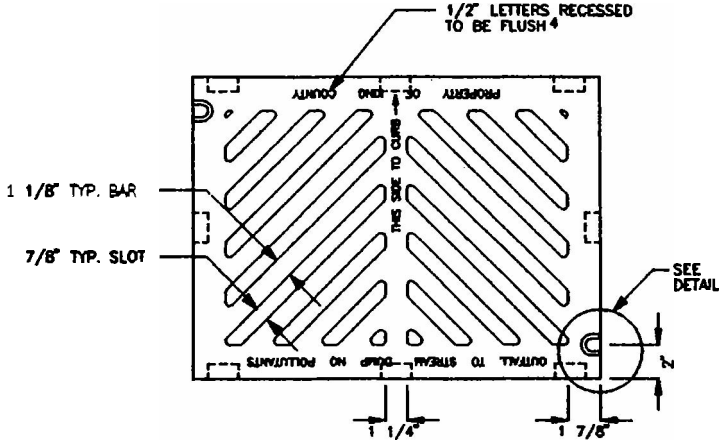
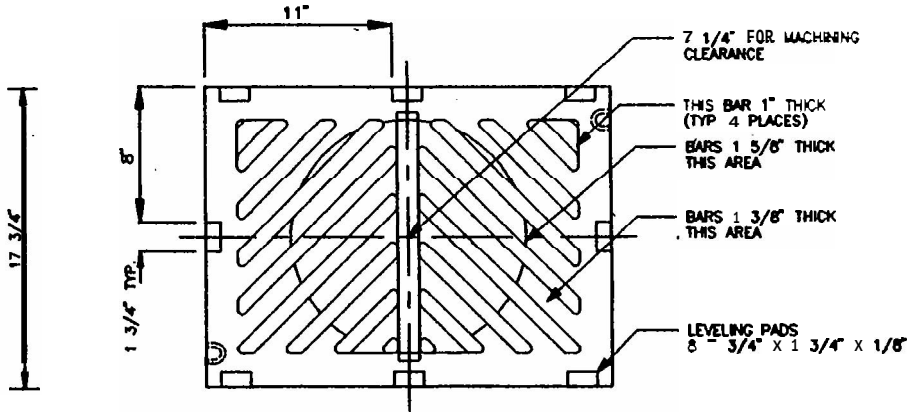
CURB INLET

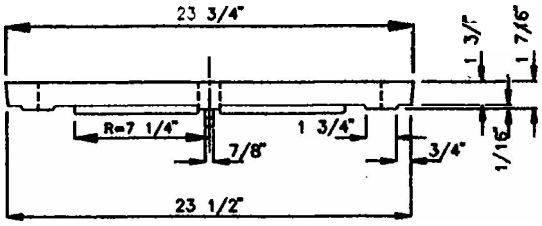
DWG. NO. 2-012



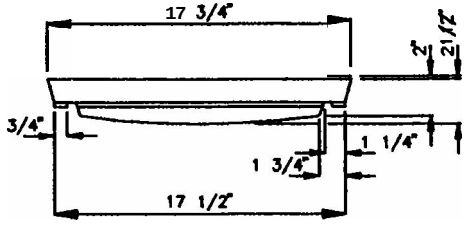
TOP VIEW



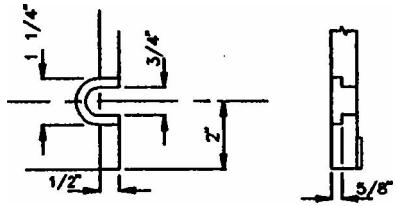
BOTTOM VIEW



SIDE VIEW



END VIEW



SLOT DETAIL
SEE NOTE 1

NOTES:

1. SLOT FORMED AND RECESSED FOR 5/8"-11 NC X 2" SOCKET HEAD (ALLEN HEAD) CAP SCREW.
2. CRATE SHALL BE CAST IRON PER ASTM A48 CLASS 30 UNLESS OTHERWISE SPECIFIED.
3. SEE SEC. 7.05.
4. THE WORDS 'PROPERTY OF KING COUNTY' SHALL BE OMITTED IF CRATE IS ON PRIVATE SYSTEM.

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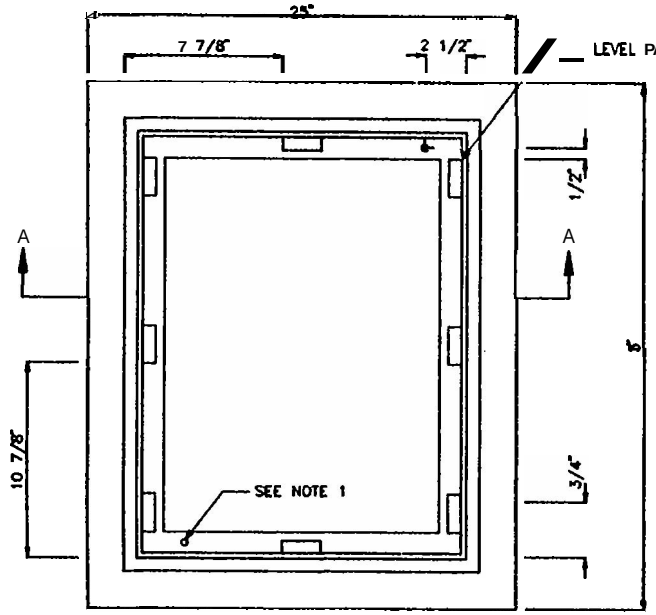
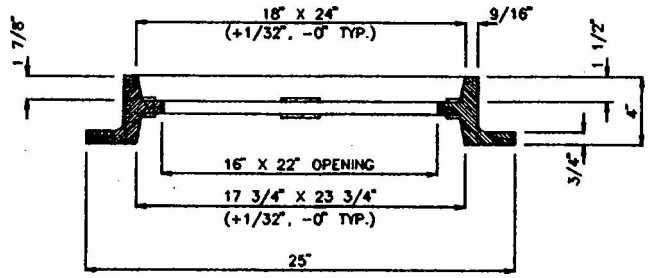
STANDARD GRATE

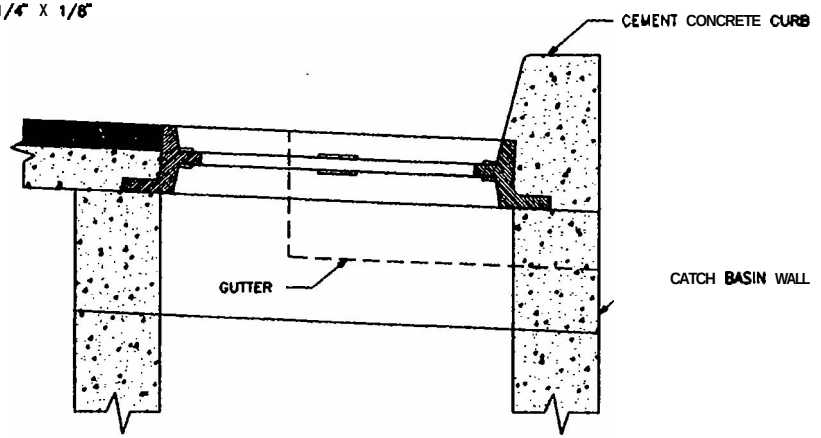
DWG. NO. 2-013



PLAN

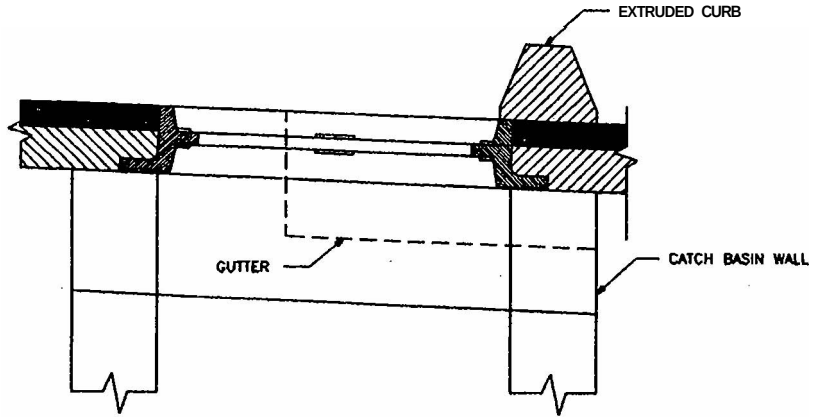


SECTION A-A



VERTICAL CURB

SEE NOTE 4



EXTRUDED CURB

SEE NOTE 4

NOTES:

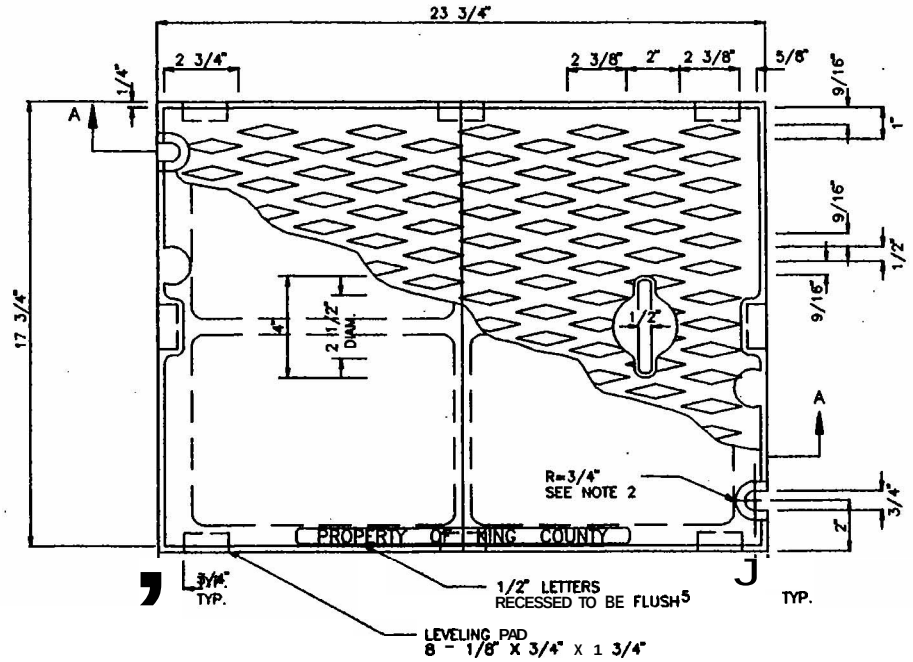
1. DRILL AND TAP FOR. AND PROVIDE. TWO LOCKING BOLTS 5/6-11 NC STAINLESS **TYPE 304** STEEL SOCKET HEAD (ALLEN HEAD) CAP SCREWS **2"** LONG WHEN USED WITH SOLID COVER (DWG. NO. **2-015)** OR WHEN SPECIFIED BY ENGINEER.
2. FRAME **MATERIAL** IS CAST IRON PER **ASTM** A48 CLASS **30**
3. SET FRAME TO GRADE AND CONSTRUCT ROAD AND **GUTTER** TO BE FLUSH WITH FRAME.
4. SEE SEC. **7.05.**

DATE	REVISION	BY	APPR'D

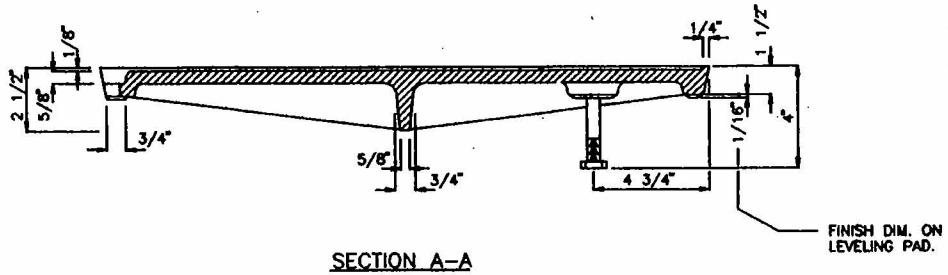
KING COUNTY PUBLIC WORKS
KING **COUNTY,** WASHINGTON

STANDARD FRAME WITH VERTICAL OR EXTRUDED CURB INSTALLATION

DWG. **2-014**



PLAN COVER



SECTION A-A

NOTES:

1. USE WITH FRAME (DWG. NO. 2-014) DRILLED AND TAPPED FOR LOCKING BOLTS.
2. USE WITH TWO LOCKING BOLTS 5/8"-11 NC STAINLESS STEEL TYPE 304 STEEL SOCKET HEAD (ALLEN HEAD) CAP SCREWS, 2" LONG.
3. MATERIAL IS CAST IRON PER ASTM A48 CLASS 30.
4. SEE SEC. 7.05.
5. THE WORDS "PROPERTY OF KING COUNTY" SHALL BE OMITTED IF COVER IS ON A PRIVATE SYSTEM.

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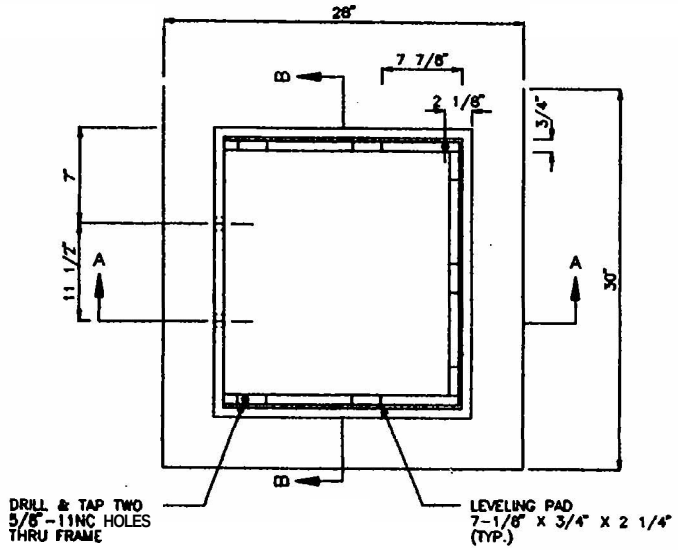
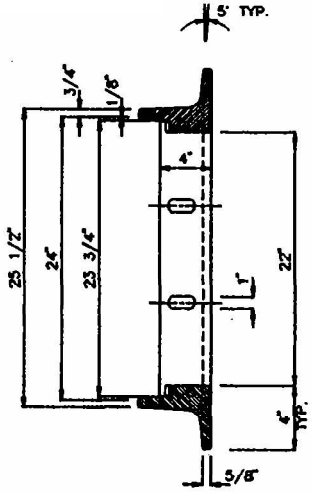
KING COUNTY PUBLIC WORKS
KING COUNTY, WASHINGTON

SOLID COVER

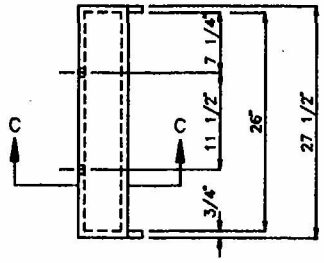
DWG. NO. 2-015



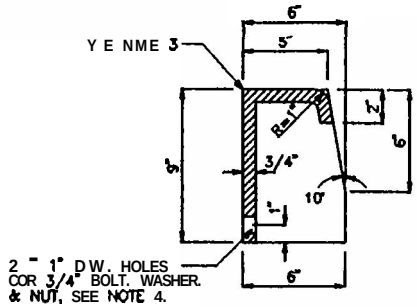
PLAN



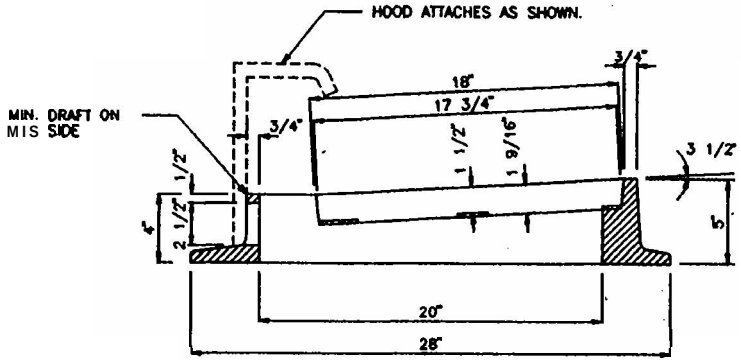
SECTION B-B



HOOD DETAIL



SECTION C-C



SECTION A-A

NOTES:

1. MATERIAL IS CAST IRON ASTM A48 CLASS 30.
2. SEE DWG. NO. 2-018 FOR VANED GRATE.
3. PATTERN ON TOP SURFACE OF HOOD SHALL BE 3/16 NON-SKID DIAMOND.
4. BOLT, WASHER. AND NUT SHALL BE GALV. OR CORROSION RESISTANT.
5. SEE SEC. 7.05.

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KING COUNTY PUBLIC WORKS
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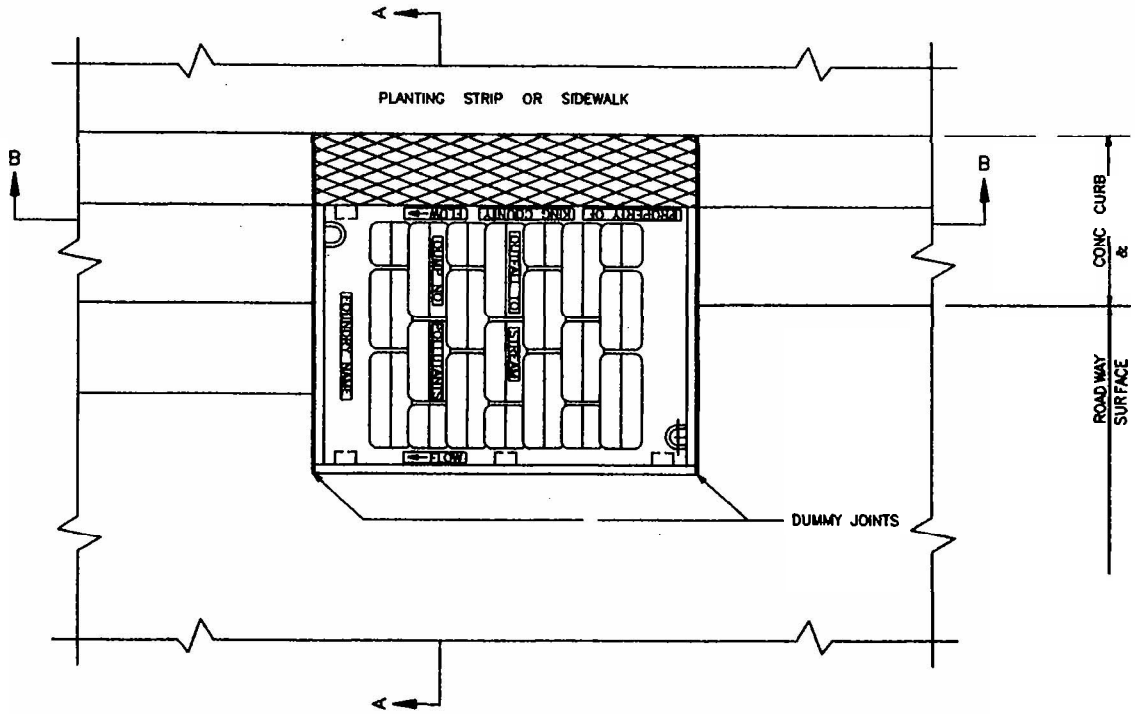
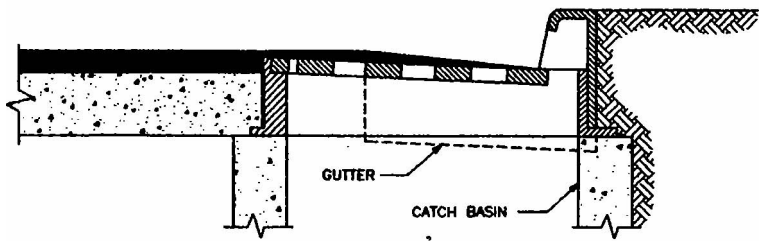
THROUGH-CURB **INLET** FRAME

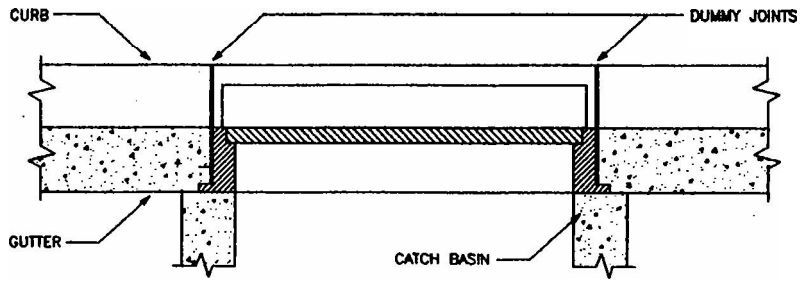
DWG. NO. 2-016



PLAN



SECTION A–A



SECTION B–B

NOTES:

1. SET TO GRADE AND CONSTRUCT ROAD AND GUTTER TO BE FLUSH WITH FRAME.
2. SEE SEC. 3.04 FOR JOINT REQUIREMENTS

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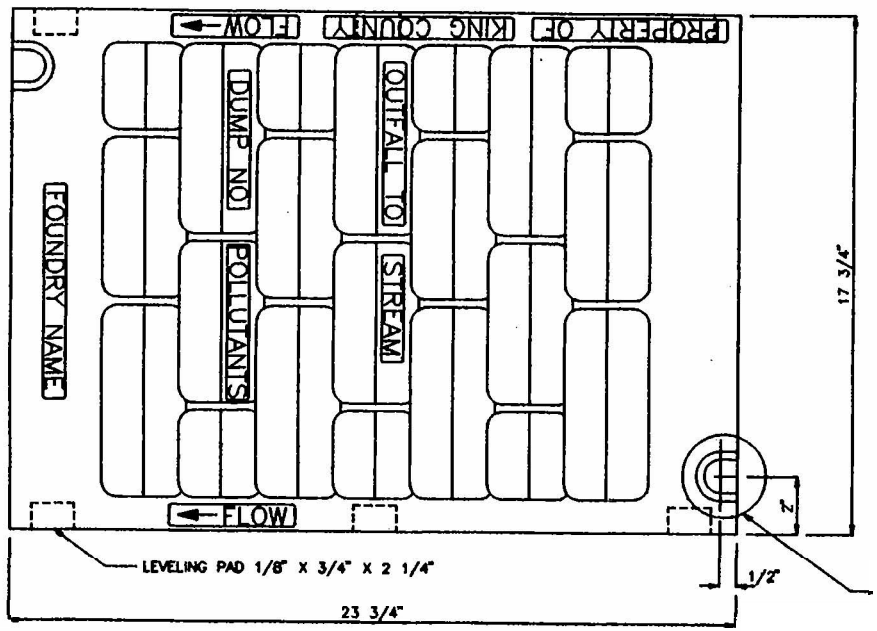
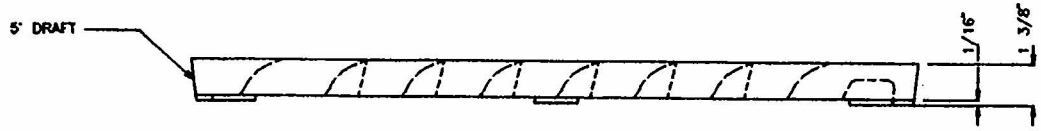
KING COUNTY PUBLIC WORKS
KING COUNTY. WASHINGTON

THROUGH–CURB INLET FRAME & GRATE WITH VERTICAL CURB INSTALLATION

DWG. NO. 2–017



PLAN



ELEVATION

NOTES:

1. SELF-LOCK VANED GRATE MANUFACTURER SUBJECT TO APPROVAL BY ENGINEER.
2. USE WITH TWO LOCKING BOLTS 5/8"-11 NC STAINLESS TYPE 304 STEEL SOCKET HEAD (ALLEN HEAD) CAP SCREWS 2" LONG. NOTE SLOT DETAIL.
3. MATERIAL IS DUCTILE IRON ASTM A536 GRADE 80-55-06.
4. "OUTFALL TO STREAM DUMP NO POLLUTANTS" MAY BE LOCATED ON BORDER AREA.
5. SEE SEC. 7.05.
6. THE WORDS "PROPERTY OF KING COUNTY" SHALL BE OMITTED IF GRATE IS ON PRIVATE SYSTEM.

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KING COUNTY PUBLIC WORKS
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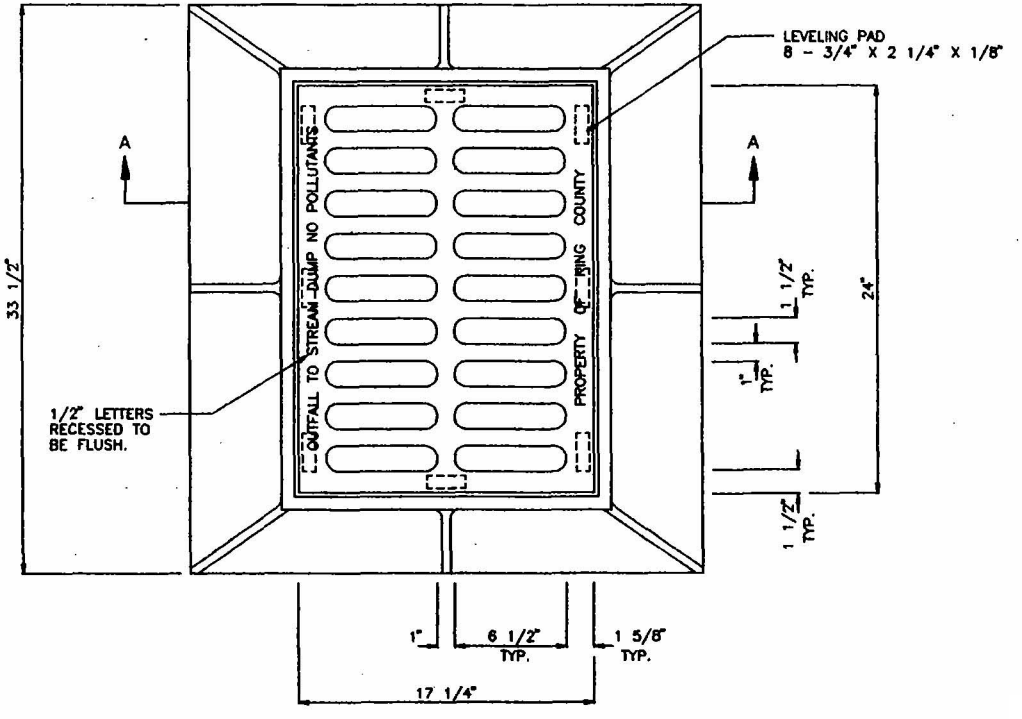
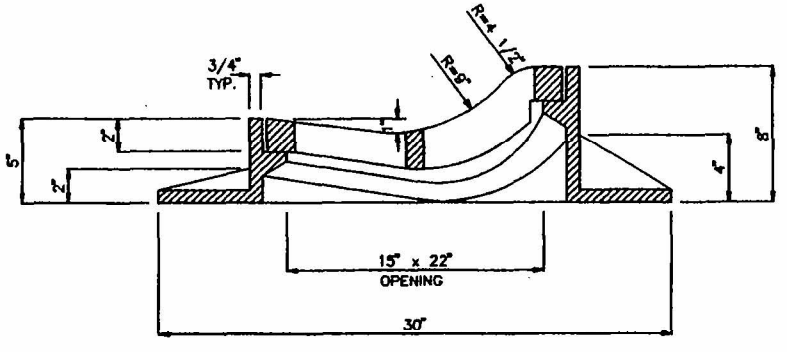
VANED GRATE

DWG. NO. 2-018



PLAN



SECTION A–A

NOTES:

1. MATERIAL IS CAST IRON ASTM A48 CLASS 30.
2. SEE SEC. 7.05.
3. THE WORDS "PROPERTY OF KING COUNTY" SHALL BE OMITTED IF ON A PRIVATE SYSTEM.
4. NOT TO BE USED ON THICKENED EDGE ROADWAYS.

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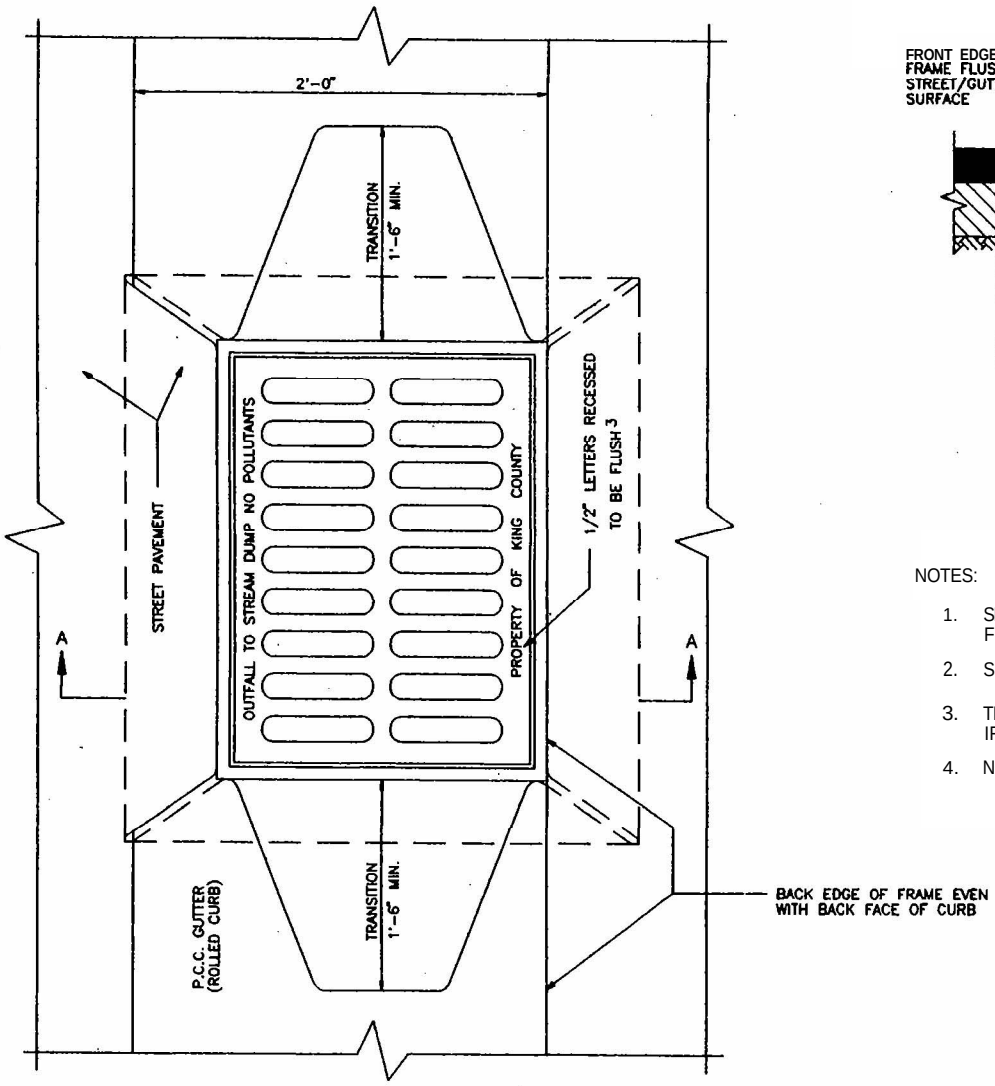
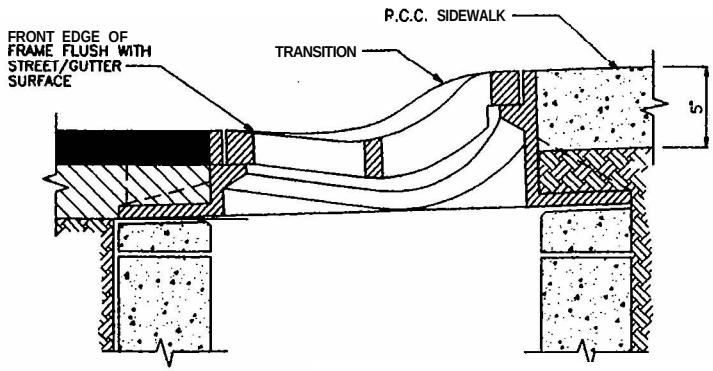
KING COUNTY PUBLIC WORKS
KING COUNTY, WASHINGTON

ROLLED CURB FRAME & GRATE

DWG. NO. 2-019



PLAN



SECTION A–A

NOTES:

1. SET FRAME TO GRADE AND CONSTRUCT ROAD AND CURB TO BE FLUSH AT FRONT AND BACK OF FRAME.
2. SEE SEC. 7.05.
3. THE WORDS "PROPERTY OF **KING COUNTY**" SHALL BE OMITTED IF GRATE IS ON A PRNATE SYSTEM.
4. NOT TO BE USED ON THICKENED EDGE ROADWAYS.

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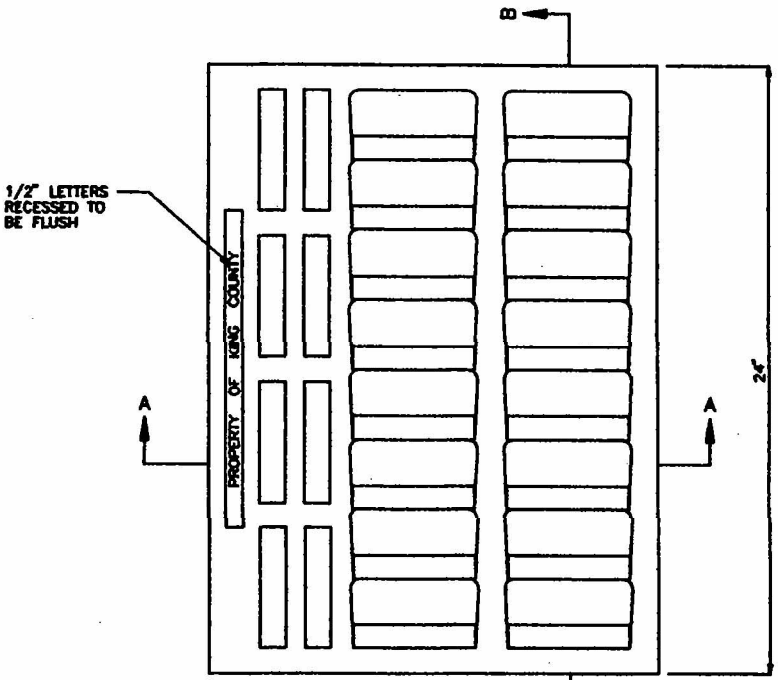
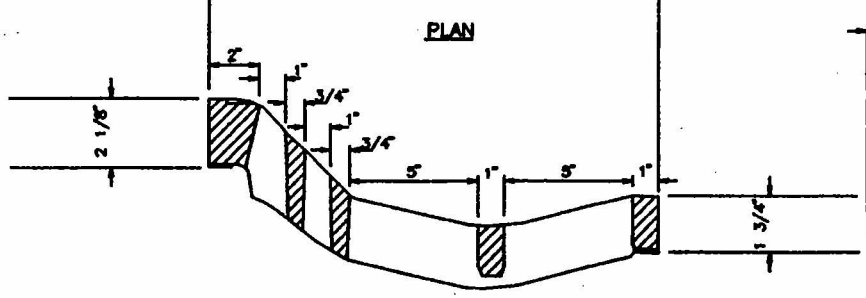
ROLLED CURB FRAME & GRATE INSTALLATION

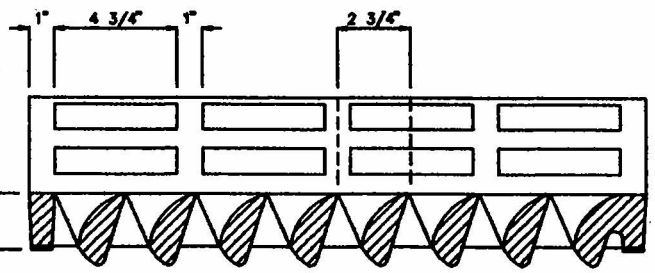
DWG. NO. 2–020



PLAN



SECTION A-A



SECTION B-B

NOTES:

1. MATERIAL IS CAST IRON ASTM A48 CUSS 30.
2. SEE SEC. 7.05.
3. THE WORDS 'PROPERTY OF KING COUNTY' SHALL BE OMITTED IF ON A PRIVATE SYSTEM.

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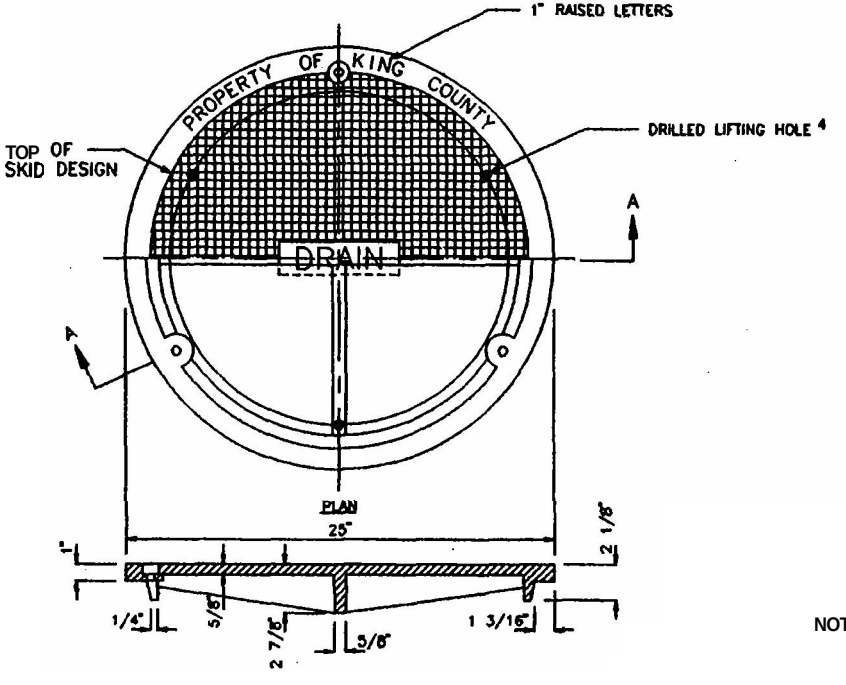
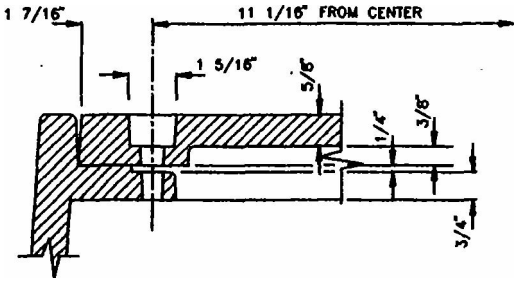
ROLLED CURB VANED GRATE

DWG. NO. 2-021



SECTION A–A



BOLT–DOWN DETAIL

COVER SKID DESIGN DETAIL

NOTES:

1. USE WITH THREE LOCKING BOLTS 5/8"–11 NC STAINLESS TYPE 304 STEEL SOCKET HEAD (ALLEN HEAD) CAP SCREWS 2" LONG. DRILL HOLES SPACED 120° AT 11 1/16' RADIUS.
2. MATERIAL IS DUCTILE IRON ASTM A536 GRADE 80–55–06
3. SEE SEC. 7.05.
4. DRILL THREE 1 INCH HOLES SPACED AT 120° AND 9 1/2" RADIUS.

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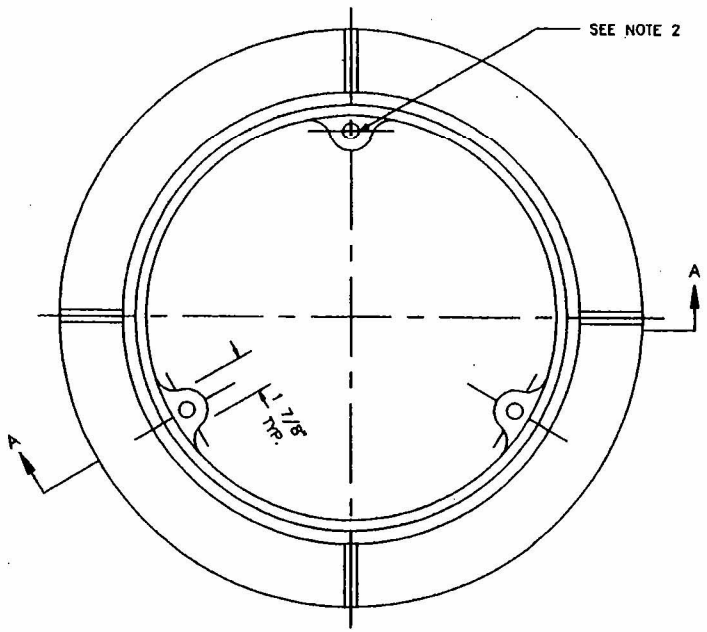
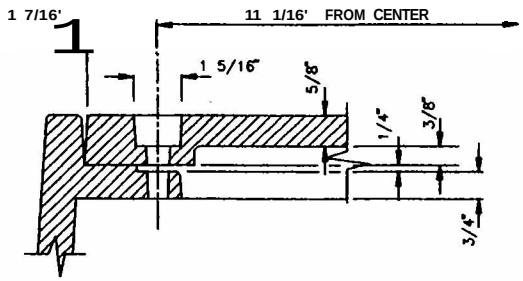
LOCKING MANHOLE COVER

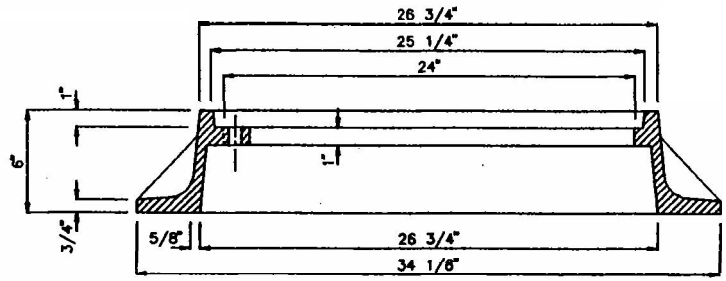
DWG. NO. 2–022



PLAN



BOLT-DOWN DETAIL



SECTION A-A

NOTES:

1. MATERIAL IS CAST IRON ASTM A48 CLASS 30.
2. DRILL AND TAP THREE 5/8"-11 NC HOLES THROUGH FRAME AT 12V AND 11 1/16" RADIUS.
3. SEE SEC. 7.05.

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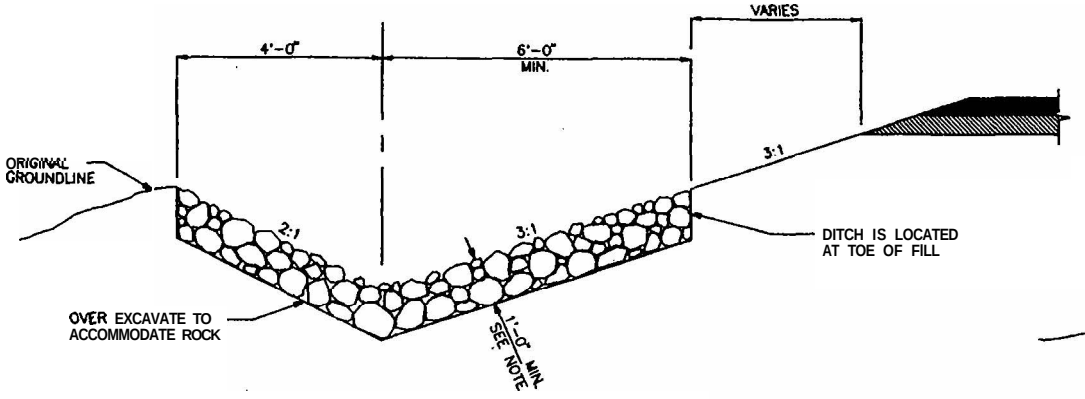
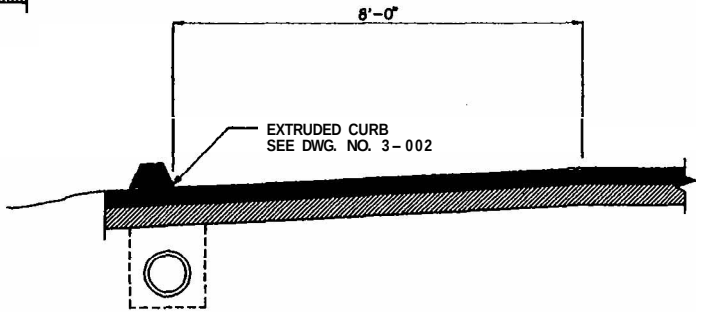
LOCKING MANHOLE FRAME

DWG. NO. 2-023



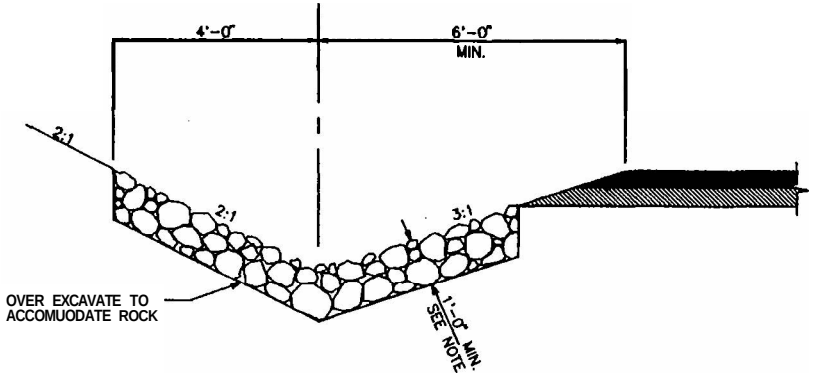
ROCK–LINED SHOULDER DITCH
IN FILL SECTION



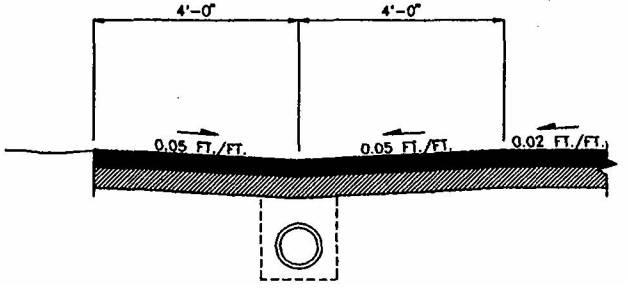
CURBED SHOULDER

NOTES:

1. DEEPER ROCK FILL MAY BE SPECIFIED.
2. SEE SEC. 7.02.



ROCK–LINED SHOULDER DITCH
IN CUT SECTION



TURNPIKE SHOULDER

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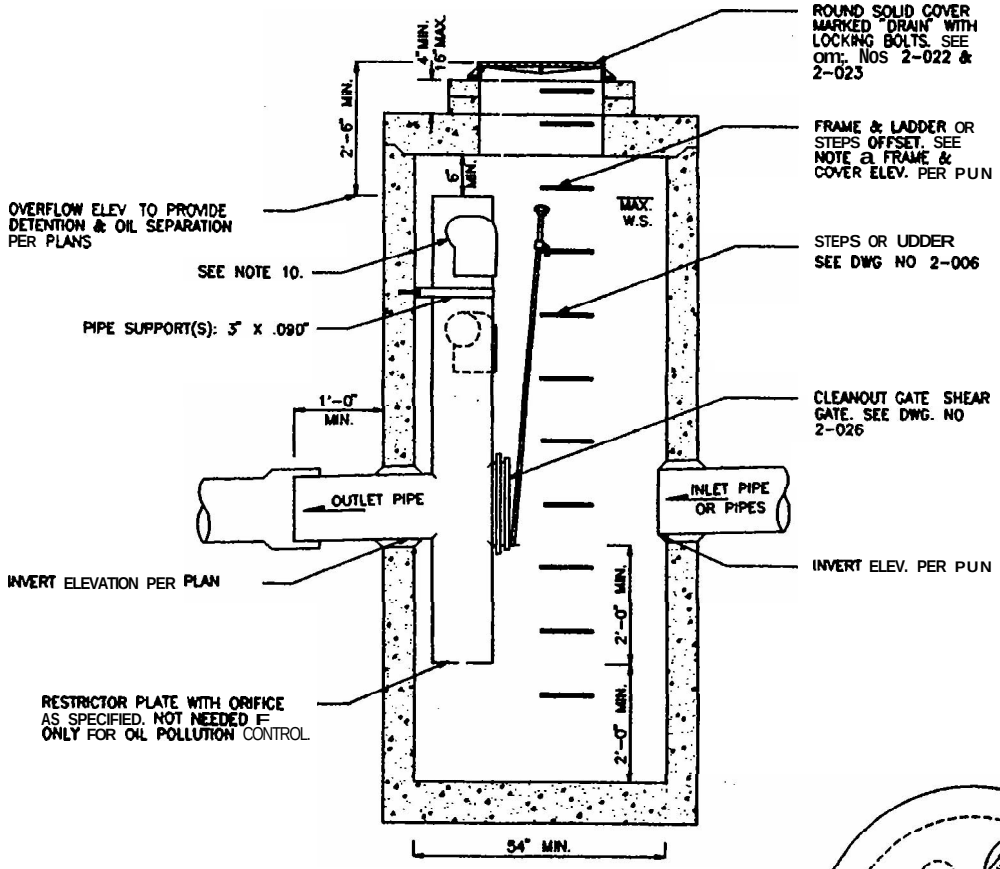
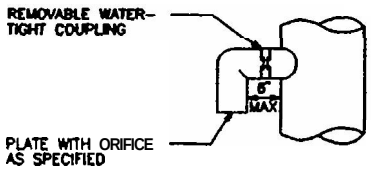
ROCK–LINED SHOULDER DITCHES & CURBED OR TURNPIKE SHOULDERS

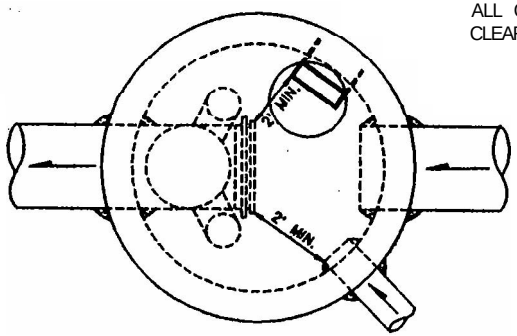
DWG. NO. 2–024



CATCH BASIN TYPE 2
DIAM. AS REQUIRED
SEE DWG NO 2-005.



ELBOW DETAIL



PLAN

NOTES

1. PIPE SIZES AND SLOPES PER PLANS
2. OUTLET CAPACITY. NOT LESS THAN COMBINED INLETS.
3. EXCEPT AS SHOWN OR NOTED. UNITS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS FOR CATCH BASIN TYPE 2, 54" MIN. D W .
4. PIPE SUPPORTS AND RESTRICTOR/SEPARATOR SHALL BE OF SAME MATERIAL, AND BE ANCHORED AT 3' MAX. SPACING BY 5/8" DIAM STAINLESS STEEL EXPANSION BOLTS OR EMBEDDED 2" IN WALL.
5. THE RESTRICTOR/SEPARATOR SHALL BE FABRICTED FROM .060" ALUMINUM. OR .064" ALUMINIZED STEEL OR 064" GALVANIZED STEEL PIPE; IN ACCORDANCE WITH AASHTO M 36, M 196. M 197 AND M 274 GALVANIZED STEEL SHALL HAVE TREATMENT 1
6. OUTLET SHALL BE CONNECTED TO CULVERT OR SEWER PIPE WITH A STANDARD COUPLING BAND FOR CORRUGATED METAL PIPE. OR GROUTED INTO THE BELL OF CONCRETE PIPE
7. THE VERTICAL RISER STEM OF THE RESTICTOR/SEPARATOR SHALL BE THE SAME D M . AS THE HORIZONTAL OUTLET PIPE. WITH AN 8" MIN. D M .
8. FRAME AND LADDER OR STEPS OFFSET SO THAT:
   A. CLEANOUT GATE IS VISIBLE FROM TOP.
   B. CLIMB DOWN SPACE IS CLEAR OF RISER AND CLEANOUT GATE.
   C. FRAME IS CLEAR OF CURB.
9. IF METAL OUTLET PIPE CONNECTS TO CEMENT CONCRETE PIPE: OUTLET PIPE TO HAVE SMOOTH OD. EQUAL TO CONCRETE PIPE I.D LESS 1/4".
10. MULTI-ORIFICE ELBOWS MAY BE LOCATED AS SHOWN OR ALL ON ONE SIDE OF RISER TO ASSURE LADDER CLEARANCE.

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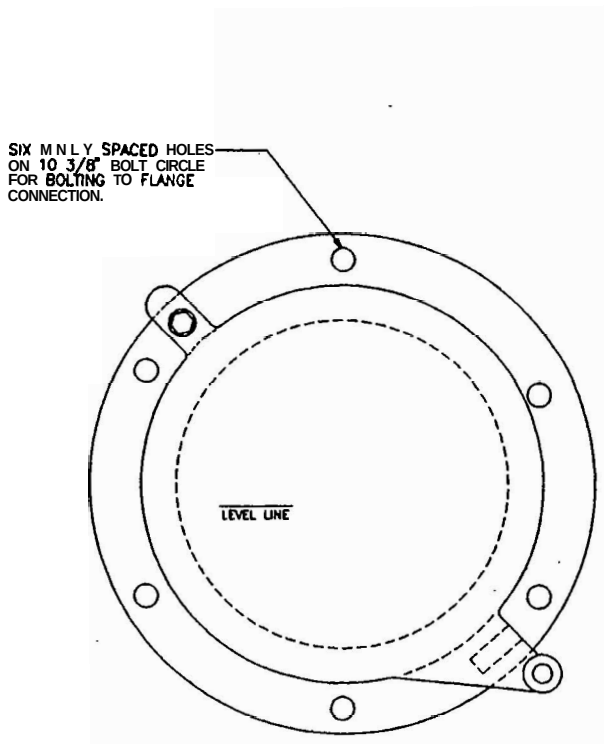
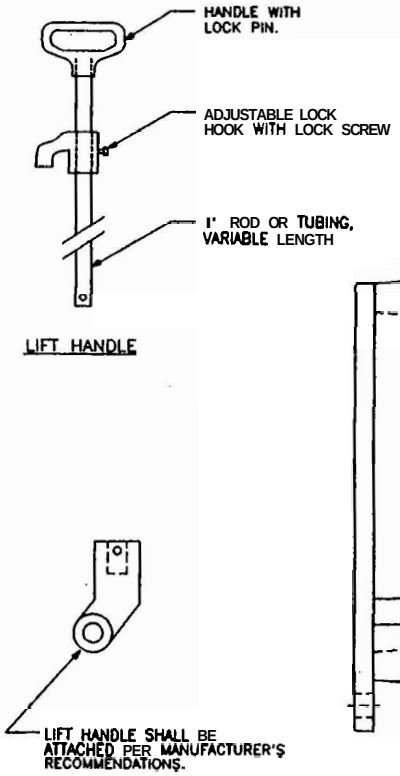
FLOW RESTRICTOR / OIL POLLUTION CONTROL DEVICE, TEE TYPE (FROP-T)

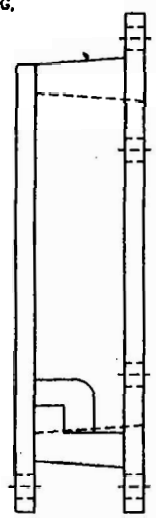
DWG. NO. 2-025



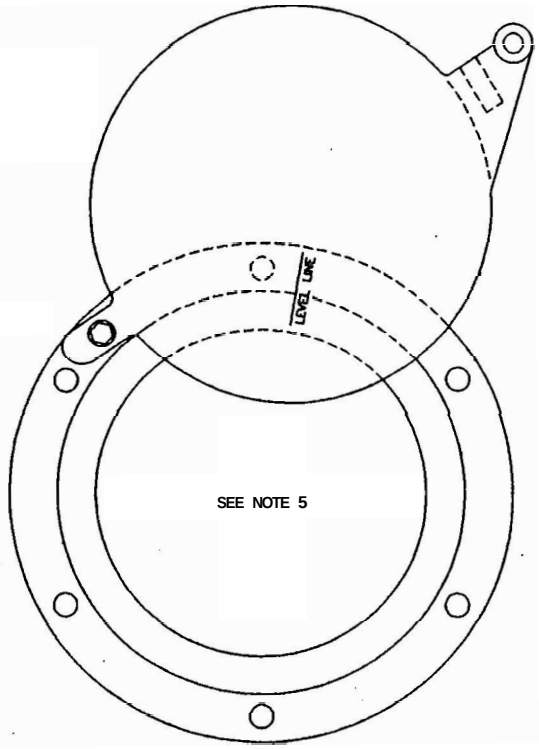
FRONT



LIFT HANDLE



SIDE



MAXIMUM OPENING OF GATE

NOTES:

1. SHEAR GATE SHALL BE ALUMINUM ALLOY PER ASTM B-26-ZG-32a OR CAST IRON ASTM A48 CLASS 30B AS REQUIRED.
2. GATE SHALL BE 8" DIAM. UNLESS OTHERWISE SPECIFIED.
3. GATE SHALL BE JOINED TO TEE SECTION BY BOLTING (THROUGH FLANGE). WELDING. OR OTHER SECURE MEANS.
4. LIFT ROD: AS SPECIFIED BY MFR WITH HANDLE EXTENDING TO WITHIN ONE FOOT OF COVER AND ADJUSTABLE HOOK LOCK FASTENED TO FRAME OR UPPER HANDHOLD.
5. GATE SHALL NOT OPEN BEYOND THE CLEAR OPENING BY LIMITED HINGE MOVEMENT, STOP TAB, OR SOME OTHER DEVICE.
6. NEOPRENE RUBBER GASKET REQUIRED BETWEEN RISER MOUNTING FLANGE AND GATE FLANGE.
7. MATING SURFACES OF LID AND BODY TO BE MACHINED FOR PROPER FIT.
8. FLANGE MOUNTING BOLTS SHALL BE 3/8" DIAM. STAINLESS STEEL.
9. ALTERNATE CLEANOUT/SHEAR GATES TO THE DESIGN SHOWN ARE ACCEPTABLE. PROVIDED THEY MEET THE MATERIAL SPECIFICATIONS ABOVE AND HAVE A SIX BOLT. 10 3/8" BOLT CIRCLE FOR BOLTING TO THE FLANGE CONNECTION

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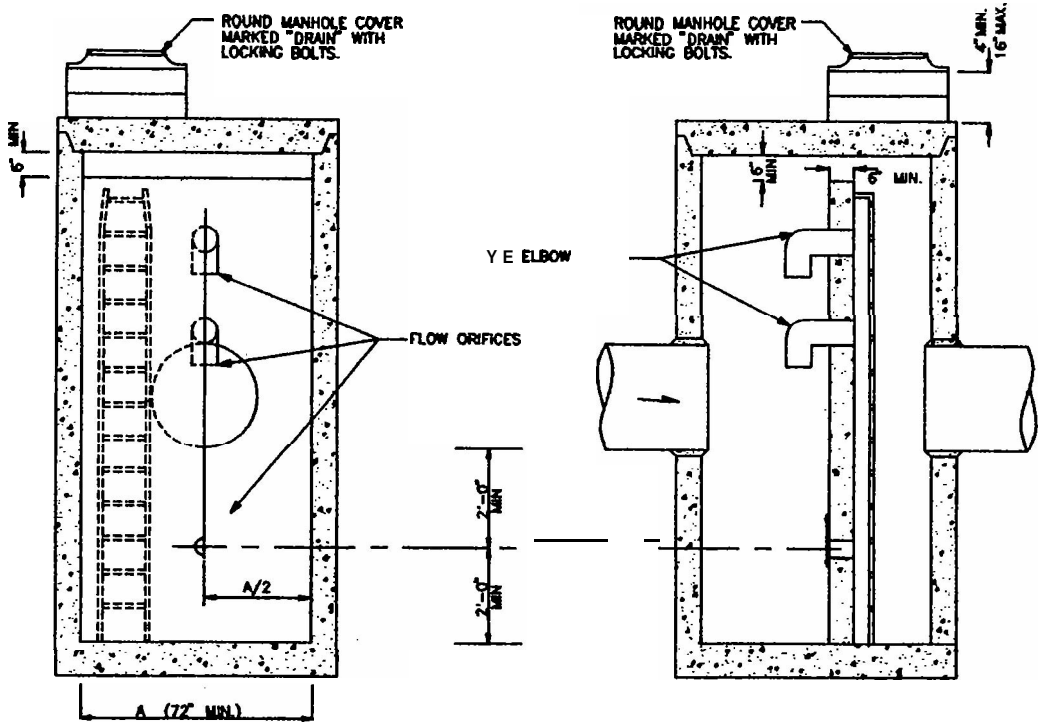
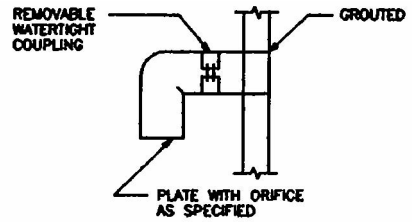
FROP-T SHEAR GATE DETAIL

DWG. NO. 2-026

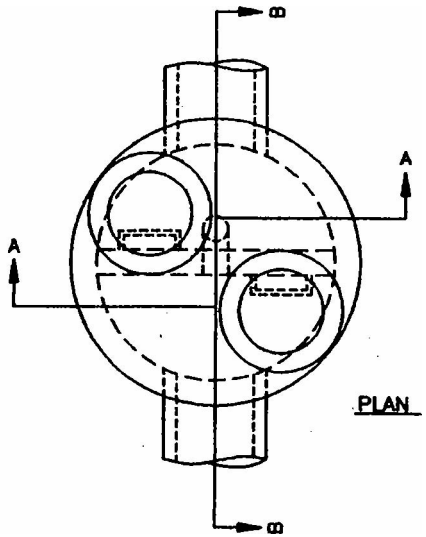


NOTES:

1. **PIPE** SIZE. SLOPES AND ALL ELEVATIONS: PER PLANS.
2. **OUTLET CAPACITY:** NOT LESS THAN COMBINED INLETS.
3. CATCH BASIN: **TYPE** 2, TO BE CONSTRUCTED IN ACCORDANCE WITH DWG. NO. 2-005 AND **AASHTO M199** UNLESS OTHERWISE SPECIFIED.
4. **COVERS:** ROUND. SOLID **MARKED "DRAIN,"** WITH LOCKING BOLTS SEE DWG. NO. **2-022 & 2-023.**
5. ORIFICES: **SIZED** AND LOCATED AS REQUIRED. **WITH** LOWEST ORIFICE **MIN. 2' FROM** BASE.
6. BAFFLE WALL SHALL HAVE #4 BAR AT **12"** SPACING **EACH** WAY.
7. PRECAST BAFFLE **WALL SHALL** BE **KMO** AND GROUTED **IN** PLACE.
8. BOTTOM ORIFICE PLATE TO BE 1/4" MIN. GALVANIZED STEEL AND **ATTACHED WITH 1/2" STAINLESS** STEEL BOLTS. **OMIT** ORIFICE PLATE **IF** ONLY FOR OIL SEPARATION.
9. UPPER FLOW ORIFICE SHALL BE ALUMINUM. **ALUMINIZED** STEEL OR **GALVANIZED** STEEL. SEE DWG. NO. **2-025.** GALVANIZED STEEL **SHALL** HAVE TREATMENT 1.



ELBOW DETAIL



PLAN

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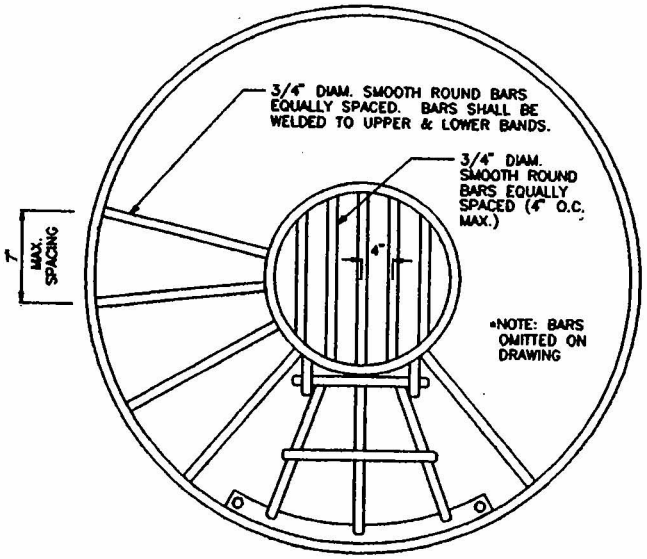
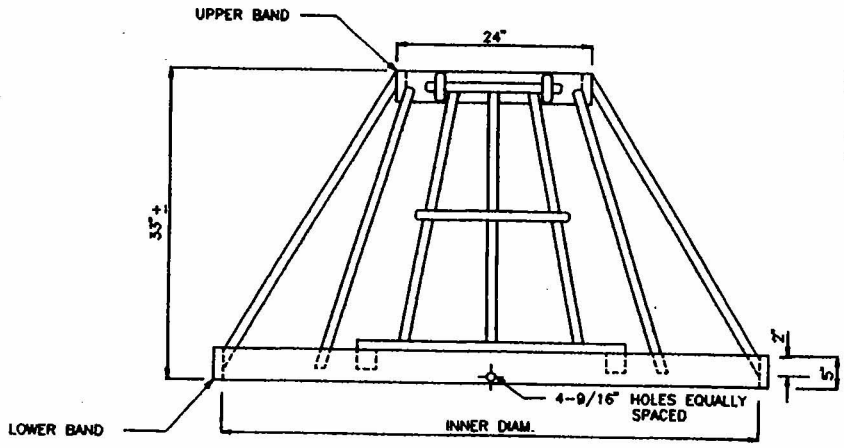
FLOW RESTRICTOR / OIL POLLUTION CONTROL DEVICE, BAFFLE TYPE (FROP-B)

DWG. NO. 2-027

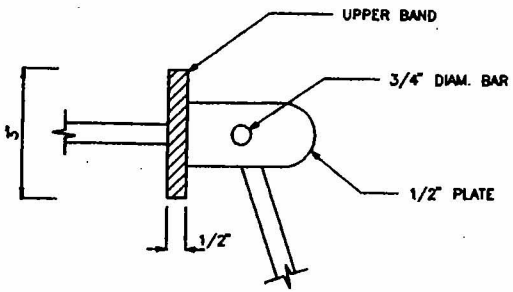


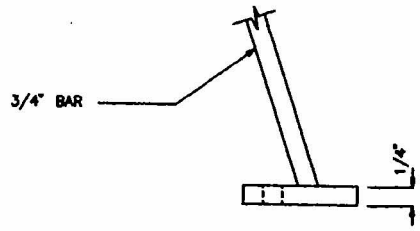
PLAN

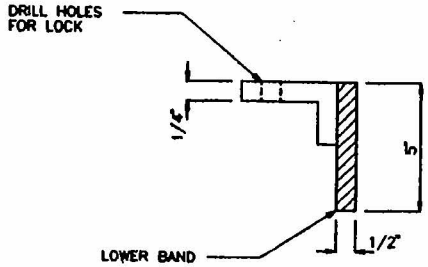


ELEVATION

CB	INNER DIAM.
48"	58"
54"	65"
60"	72"
72"	86"
96"	114"







ENTRY GATE DETAIL

NOTES:

1. ALL STEEL IN PLATES, BARS AND BANDS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A36.
2. DEBRIS CAGE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A123 (AASHTO M111).

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DEBRIS CAGE

DWG. NO. 2-028